PLAN &
ENVIRONMENTAL IMPACT STATEMENT

OAK ORCHARD CREEK WATERSHED

GENESEE AND ORLEANS COUNTIES, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Syracuse, New York

PLAN AND ENVIRONMENTAL IMPACT STATEMENT

OAK ORCHARD CREEK WATERSHED

Orleans and Genesee Counties, New York

Prepared Under the Authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended and in accordance with the National Environmental Policy Act of 1969, Section 102(2) (C) Public Law 91-190 - 91st Congress 83 Stat. 853.

Prepared by: Orleans County Board of Supervisors
Genesee County Legislature
Orleans County Soil and Water Conservation District
Genesee County Soil and Water Conservation District
U. S. Department of Agriculture, Soil Conservation Service
U. S. Department of Agriculture, Forest Service

May 1975

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PLAN AGREEMENT

between the

ORLEANS COUNTY BOARD OF SUPERVISORS
GENESEE COUNTY LEGISLATURE
ORLEANS COUNTY SOIL AND WATER CONSERVATION DISTRICT
GENESEE COUNTY SOIL AND WATER CONSERVATION DISTRICT

(hereinafter referred to as the Sponsoring Local Organization)

State of New York

and the

Soil Conservation Service
United States Department of Agriculture
(hereinafter referred to as the Service)

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsoring Local Organization for assistance in preparing a plan for works of improvement for the Oak Orchard Creek Watershed, State of New York, under the authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83d Congress; 68 Stat. 666), as amended; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Service; and

Whereas, there has been developed through the cooperative efforts of the Sponsoring Local Organization and the Service a mutually satisfactory plan for works of improvement for the Oak Orchard Creek Watershed, State of New York, hereinafter referred to as the plan, of which this agreement is a part;

Now, therefore, in view of the foregoing considerations, the Sponsoring Local Organization and the Secretary of Agriculture, through the Service, hereby agree on the plan, and further agree that the works of improvement as set forth in said plan can be installed in about 7 years.

It is mutually agreed that in installing and operating and maintaining the works of improvement substantially in accordance with the terms, conditions, and stipulations provided for in the plan:

1. The Sponsoring Local Organization will acquire such landrights as will be needed in connection with the works of improvement. (Estimated Cost $378,000).

2. The Sponsoring Local Organization assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the Sponsoring Local Organization and the Service as follows:

	Sponsoring Local Organization (percent)	Service (percent)	Estimated Relocation Payment Costs (dollars)
Relocation Payments	40.5	59.5	0 1/

1/ Investigation has disclosed that under present conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost-shared in accordance with the percentages shown.

3. The Sponsoring Local Organization will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement.

4. The percentages of construction costs of structural measures to be paid by the Sponsoring Local Organization and by the Service are as follows:

Works of Improvement	Sponsoring Local Organization (percent)	Service (percent)	Estimated Construction Cost (dollars)
All Structural Measures	0	100	2,455,000

5. The percentages of the engineering costs to be borne by the Sponsoring Local Organization and the Service are as follows:

Works of Improvement	Sponsoring Local Organization (percent)	Service (percent)	Estimated Engineering Costs (dollars)
All Structural Measures	0	100	269,000

6. The Sponsoring Local Organization and the Service will each bear the costs of Project Administration which it incurs, estimated to be $35,000 and $319,000 respectively.

7. The Sponsoring Local Organization will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the plan.

8. The Sponsoring Local Organization will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.

9. The Sponsoring Local Organization will be responsible for the operation and maintenance of the structural works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.

10. The costs shown in this agreement represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.

11. This agreement is not a fund obligating document. Financial and other assistance to be furnished by the Service in carrying out the plan is contingent on the availability of appropriations for this purpose.

    A separate agreement will be entered into between the Service and the Sponsoring Local Organization before either party initiates work involving funds of the other party. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. The plan may be amended or revised, and this agreement may be modified or terminated, only by mutual agreement to the parties hereto except for cause. The Service may terminate financial and other assistance in whole, or in part, at any time whenever it is determined that the Sponsoring Local Organization has failed to comply with the conditions of this agreement. The Service shall promptly notify the Sponsoring Local Organization in writing of the determination and the reasons for the termination, together with the effective date. Payments made to the Sponsoring Local Organization or recoveries by the Service under projects terminated for cause shall be in accord with the legal rights and liabilities of the parties.

13. No member of or delegate to congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

14. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 C.F.R. 15.1-15.12), which provide that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.

15. This agreement will not become effective until the Service has issued a notification of approval and authorizes assistance.

_____ By _____
Local Organization

Title _____

_____
Address Zip Code Date _____

The signing of this agreement was authorized by a resolution of the governing body of the _____
Local Organization

adopted at a meeting held on _____

_____ _____
Secretary, Local Organization Address Zip Code

Date _____

_____ By _____
Local Organization

Title _____

_____
Address Zip Code Date _____

The signing of this agreement was authorized by a resolution of the governing body of the _____
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Date _____

_____ By _____
Local Organization

Title _____

_____
Address Zip Code Date _____

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Local Organization

adopted at a meeting held on _____

_____ _____
Secretary, Local Organization Address Zip Code

Date _____

_____ By_____
Local Organization

Title_____

_____
Address Zip Code Date_____

The signing of this agreement was authorized by a resolution of the governing body of the_____
Local Organization
adopted at a meeting held on_____

_____ _____
Secretary, Local Organization Address Zip Code

Date_____

Appropriate and careful consideration has been given to the environmental statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service
United States Department of Agriculture

By_____
State Conservationist

Date_____

OAK ORCHARD CREEK WATERSHED

ORLEANS AND GENESEE COUNTIES, NEW YORK

SUMMARY OF PLAN

Oak Orchard Creek Watershed, located in Orleans and Genesee Counties, New York, has a drainage area of 39,860 acres. The Sponsoring Local Organizations are the Genesee County Legislature, the Genesee County Soil and Water Conservation District, the Orleans County Board of Supervisors, and the Orleans County Soil and Water Conservation District.

The primary soil and water resource problem is periodic inundation of high value vegetable crops on about 6,560 acres of muckland. The present channels in the problem area are adequate in depth and capacity for drainage purposes. However, excess runoff from the upland areas flood the muck on an annual basis. Sheet erosion rates of up to 6.4 tons per acre per year occur on steep cropland. The muckland is damaged by wind erosion. Subsidence is accelerated through the lack of water level controls.

Estimated average annual floodwater damages of $592,800 are occurring to crops. Indirect flood damages, including disruption of transportation and utilities, are estimated at $59,300.

This plan provides for the installation of land treatment measures, about 100 structures for water control, and about 90 miles of channel work. The land treatment measures and structural measures will be installed during a 7-year period.

Installation of the land treatment measures will reduce erosion rates on upland cropland to less than 3 tons per acre annually. Sediment concentrations at the mouth of the watershed will be reduced from 145 to 107 milligrams per liter.

Project measures will reduce annual floodwater damages by about 85 percent. Damages will be eliminated from storms up to the 10-year frequency event with some damages remaining from storms of greater magnitude. About 100 muckland farms and about 350 people will receive direct floodwater reduction benefits. Indirect floodwater reduction benefits will be derived by reducing interruptions of utilities and commerce.

Approximately 636 of the 675 acres of land committed to the construction of the channel work are now being used for the existing channel system and travelways. Ten acres of muckland will be removed from agricultural production. One acre of open land formerly cropped and 28 acres of forest land will be affected. Perennial weed growth on existing channel banks will be replaced by permanent seedings of grasses and legumes, which will provide nesting cover for songbirds and waterfowl. Muskrat activity in the channel will be temporarily disturbed during construction and operation and maintenance.

The Orleans and Genesee Counties Soil and Water Conservation Districts will be responsible for planning land treatment measures with technical assistance provided by the Soil Conservation Service and the Forest Service in cooperation with the Department of Environmental Conservation, Division of Lands and Forests. Landowners and operators, with assistance furnished by the Soil Conservation Service and Forest Service, will be responsible for establishing and maintaining these practices. The Oak Orchard Creek Small Watershed Protection District, to be established by the Genesee County Legislature and Orleans County Board of Supervisors, will provide landrights, and the Soil Conservation Service will provide engineering services required for the installation of the structural measures. The Small Watershed Protection District will let and administer construction contracts. However, at a later date the sponsors may request the Service to perform this function. The Sponsors and the Service will provide project administration services required and will bear the costs that each incurs.

Total installation cost of the combined land treatment and structural measures is about $5,302,400. Of this amount, $3,158,900 will be funded by P.L. 566 and $2,143,500 will be paid for by other funds. Total land treatment cost is $1,846,400, including $115,900 from P.L. 566 funds for technical assistance and $1,730,500 from other funds. Total structural measures cost is $3,456,000, including $3,043,000 from P.L. 566 funds and $413,000 from other funds. P.L. 566 funds will provide for construction of structural measures.

The annual operation and maintenance costs of $28,000 for the structural measures will be borne by the Oak Orchard Creek Small Watershed Protection District and will be financed by taxes levied on the beneficiaries. The average annual cost of the structural measures is estimated to be $274,400. These measures are expected to produce average annual benefits of $551,600. The ratio of the total average annual benefits to the average annual cost of structural measures is 2.0 to 1.0.

All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service and the Forest Service of the U. S. Department of Agriculture.

INTRODUCTION

This plan has been briefed to avoid excessive duplication with information required in the Environmental Impact Statement. Part II should be reviewed for additional information on this project.

PLANNED MEASURES

This plan provides for the installation of land treatment measures, about 100 structures for water control, and about 90 miles of channel work (Table 3A). The land treatment measures and structural measures will be installed during a 7-year period. Through consensus of the conservation districts, community leaders, landowners, and state and federal agencies, it was agreed that adequate land treatment should be applied to 9,400 acres of cropland, 1,400 acres of pasture, 650 acres of forest, and 600 acres of other land during the 7-year installation period (Table 1).

Technical assistance will be provided to plan land use changes, install needed conservation measures, manage watershed resources, and maintain conservation measures. Assistance will be given to planning and zoning boards, community leaders, and land developers in the proper use, treatment, and development of resources. General technical assistance will also be provided for environmental education and stimulation of landowners to participate in good land management practices.

The channel work is generally classified as open channels (mains), floodways (laterals), and floodwater diversions (interceptors). These channels are designed to carry the 10-year frequency storm discharge with an effective design life of 50 years. Backwater effects of the Oak Orchard swamp were considered in evaluating channel capacities.

The floodwater diversions (40.5 miles) will be constructed around the periphery of the muck area to intercept upland flows and divert them into the floodways. The diversions will generally follow the alignment of existing ditches. Borrow from the channel will be used to construct dikes on the lower side. The materials through which the diversions will be constructed are generally mineral soils (sands and silts).

The 31.8 miles of floodways will carry water from the diversions to the main channels. Existing channel alignment will be used; however, enlargement of the flow area will be necessary.

Construction of 18.5 miles of open channels (mains) will follow the present alignments of existing manmade ditches. Their capacity will be increased by removal of bars and other obstructions in the channel and by filling low spots along existing travelways and dikes. Channels will be constructed through similar materials as described for the floodways. Excavated material will be sorted, where feasible, with mineral soils to be saved for use in the construction of roadways and dikes. Roadbanks, dikes and spoil areas will be covered with muck soil, where available, to ensure rapid establishment of vegetation to minimize erosion.

Each structure for water control consists of a sump to collect onfarm runoff; a gravity outlet pipe, with flap gate, to provide drainage during periods of low channel flow; a pump, with controls and motor, to be installed by landowners, to discharge onfarm runoff during periods of high channel flow; and shelter and appurtenances necessary for the proper functioning of the structure and protection of the equipment. The structures will be located adjacent to maintained travelways along the proposed channels. Approximately 100 structures will be required, including 70 existing structures which require modification. Pumps will be designed to pump at an average rate equivalent to one inch of runoff per 24 hours.

Channel work will require the acquisition of approximately 675 acres of land. Landrights will be acquired by fee simple title or permanent easement. Present land use is 636 acres of existing channel areas and travelways, one acre of open land formerly cropped, 10 acres of cropland, and 28 acres of forest land. Future use of this area will be for channel and travelways for channel maintenance. Public use will be restricted by gates.

Each contract will require that contractors adhere to strict guidelines for minimizing soil erosion, water, noise, and air pollution during construction. The guidelines will include provisions for measures, such as sediment basins and temporary vegetation and mulching, to protect exposed areas until permanent vegetation is established. Adherence to state and local health requirements will be required regarding disease vector control, noise, and air pollution. Suppressors will be used to keep dust within tolerable limits. Pollution of surface areas or ground water by chemicals, fuel, lubricants, sewage, and other pollutants will not be permitted. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable state and local laws. A barrier (i.e., plastic filter cloth) will be installed at the very downstream end of the channel improvement while excavation is occurring in the lower 2,500 feet of the channel work in order to minimize the chances of sediment from reaching the downstream fishery.

Requirements for safety and health, in conformance with the Federal Construction Safety Act of 1969 (P.L. 91-54), will be included in each construction contract. Design and construction will comply with applicable state laws. The plan has been coordinated with the Division of Historic Preservation, New York State Parks and Recreation. Investigations to date indicate that the project will not encroach on any historic place or any places planned for historic preservation. If artifacts or other items of archeological or historic significance are uncovered by SCS, or brought to its attention by others prior to or during construction, the Division of Historic Preservation and the National Park Service will be notified. Construction will not begin or continue until appropriate arrangements for survey or salvage have been made.

78°15'
78°10'
78°05'
43°10'
43°05'

LEGEND

- First class road
- Second class road
- Gravel road
- Watershed boundary
- County line
- Township line
- Railroad
- Streams
- Marsh
- T 195+00 — Channel designation and stationing
- Area benefited

PROJECT MEASURES

- Open channel (Main) and appurtenances (Sumps)
- Floodway (Lateral) and appurtenances (Sumps)
- Floodwater diversion (Interceptor) and appurtenances (Sumps)

MANNING MUCK
250 Ac.

ELBA MUCK
6310 Ac.

N

Sorre Ctr
East Barre
Broggs Corners
Oak Orchard Road
S Barre
McNamara Road
Longton Corners
ELBA
Dicks Creek
CENTRAL
PENN
Dows
ORLEANS COUNTY
GENESEE COUNTY
BATAVIA
ELBA
TRANSIT RD

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PROJECT MAP

OAK ORCHARD CREEK WATERSHED

GENESEE AND ORLEANS COUNTIES
NEW YORK

0 4,000' 8,000' 12,000' 16,000'
Scale in Feet

May 1974

USDA-SCS-HYATTSVILLE, MD. 1974

INSTALLATION COST - MONETARY

The total installation cost of the works of improvement is estimated to be $5,302,400. Of this total, $3,158,900 will be paid by Public Law 566 funds and $2,143,500 by other funds. Total installation cost includes $1,846,400 for establishing land treatment measures on private land and $3,456,000 for structural measures. Table 1 contains further cost information.

Land treatment costs include P.L. 566 funds of $115,900 to be used by Soil Conservation Service and Forest Service, and $3,100 of state (P.L. 566) funds, to provide accelerated technical assistance; regular SCS program funds of $34,900 and current cooperative federal-state forestry program funds of $12,100 for technical assistance to continue the going program; and costs of $1,680,400 for applying land treatment. Landowners and operators will apply land treatment with cost sharing assistance that may be available through local, state, or federal programs at the time of installation. The schedule of obligations for land treatment measures is shown in Table A.

TABLE A - SCHEDULE OF OBLIGATIONS - LAND TREATMENT

(Dollars)[1/]

Year	Public Law 566 Funds	Other Funds[2/]	Total
1	17,000	188,700	205,700
2	17,000	188,700	205,700
3	17,000	188,700	205,700
4	16,500	222,700	239,200
5	16,300	341,900	358,200
6	16,300	359,000	375,300
7	15,800	240,800	256,600
TOTAL	115,900	1,730,500	1,846,400

1/ Price Base: 1974.
2/ Includes state and cooperative forest managment technical assistance monies.

The total installation costs of structural measures include costs for construction, engineering services, landrights, and project administration. The cost for each major structural measure has been determined individually as shown in Table 2. The schedule of obligations for structural measures is shown on Table B.

TABLE B - SCHEDULE OF OBLIGATIONS - STRUCTURAL MEASURES
1/
(Dollars)

Fiscal Year	Measures	P.L. 566 Funds	Other Funds	Total
First	Engineering Services	50,000		50,000
	Landrights		131,000	131,000
	Project Administration	60,000	7,000	67,000
First Year Totals		110,000	138,000	248,000
Second	Engineering Services	55,000		55,000
	Landrights		199,000	199,000
	Project Administration	65,000	7,000	72,000
	Channel Work 2/	450,000		450,000
Second Year Totals		570,000	206,000	776,000
Third	Engineering Services	55,000		55,000
	Landrights		48,000	48,000
	Project Administration	65,000	7,000	72,000
	Channel Work 2/	570,000		570,000
Third Year Totals		690,000	55,000	745,000
Fourth	Engineering Services	55,000		55,000
	Project Administration	60,000	7,000	67,000
	Channel Work 2/	570,000		570,000
Fourth Year Totals		685,000	7,000	692,000
Fifth	Engineering Services	54,000		54,000
	Project Administration	69,000	7,000	76,000
	Channel Work 2/	865,000		865,000
Fifth Year Totals		988,000	7,000	995,000
Totals		3,043,000	413,000	3,456,000

1/ Price base: 1974

2/ Structures for water level control will be constructed as the channel work is completed.

Construction costs include the estimated contract cost plus a contingency allowance of 12 percent. All costs are based on estimated quantities and current (1974) unit costs. The unit costs were obtained from actual bid prices for similar works constructed in the state and from costs submitted by material supply firms. Construction costs include such items as excavation, earth fill, seeding, concrete, gates, and culverts. The estimated construction cost is $450,000 for the open channels and $1,140,000 for the floodways, including about 100 structures for water level control, and $865,000 for the floodwater diversion. Construction costs will be paid by P.L. 566 funds.

Engineering services costs include the direct cost of engineers and other technicians for surveys, engineering and geologic investigations, design, and preparation of plans and specifications for structural measures including associated vegetative work. The costs for engineering services are estimated at $269,000. These costs will be paid by P.L. 566 funds.

Relocation payments include moving and related expenses for a displaced person, business, or farm operation; as well as, financial assistance for replacement housing for a displaced person who qualifies and whose dwelling is acquired because of the project. No relocations are anticipated; however, in the event they should occur, the cost-sharing of relocation payments will be based on the ratio of P.L. 566 funds and other funds, minus relocation payments, to the total project cost.

Project administration costs include the costs incurred for layout, inspection, relocation assistance advisory services (when relocation occurs), administration of contracts, and other administrative and clerical services necessary to install the project. The Sponsoring Local Organization will bear the costs it incurs to administer construction contracts and for such inspection and other administrative services, as it requires, for installation of the project. The Service will bear the costs it incurs for layout, inspection, and for such other administrative, clerical, and other services it provides. The Service may not use P.L. 566 funds to assist the Sponsors to provide relocation assistance advisory services. Project administration costs are estimated to be $354,000. The Service and the Sponsors will each bear the costs of project administration it provides, estimated to be $319,000 and $35,000 respectively.

Landrights costs are estimated to be $378,000 and include all expenditures to be made in acquiring land, replacing culverts and bridges, and constructing access roads. These costs include $88,000 for culverts, $28,000 for blacktopping, and $163,000 for gravel surfacing of roads, and $99,000 for survey, legal fees, land, and other costs. Landrights costs were determined with the cooperation of the local Sponsors and will be paid entirely from funds other than P.L. 566.

BENEFITS - MONETARY

Average annual flood damage reduction benefits are estimated at $554,300 (Table 5). Crop floodwater damages will be reduced by $503,900 and indirect flood damages by $50,400. The installation of planned land treatment measures will provide flood damage reduction benefits, amounting to $52,800 annually, which were not used for project justification.

Total structural measure benefits are $551,600, including flood damage reduction benefits of $501,500 and secondary benefits of $50,100 (Table 6). Secondary benefits from a national viewpoint were not considered pertinent to the economic evaluation.

COMPARISON OF BENEFITS AND COSTS

The average annual cost of the structural measures is estimated to be $274,000. These measures are expected to produce average annual benefits, excluding secondary benefits, of $501,500 or $1.80 for each dollar of cost. The ratio of the total average annual project benefits ($551,600) to the average annual cost of structural measures ($274,400) is 2.0 to 1.0. Table 6 shows a summary of benefits, costs, and the benefit to cost ratio.

INSTALLATION PROVISIONS

The Orleans County Soil and Water Conservation District will petition the Orleans County Board of Supervisors, and the Genesee County Soil and Water Conservation District will petition the Genesee County Legislature to establish a small watershed protection district, in accordance with New York State's enabling legislation (Article 5-D of the County Law). Upon approval by the county governments, the Oak Orchard Creek Small Watershed Protection District will have legal authority and will:

1. Provide the necessary landrights for all structural measures. They will obtain landrights through condemnation, if necessary. Appraisals will be obtained as a prerequisite to securing landrights in accordance with provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894).

2. Provide for the administration of construction contracts and for such inspection and other administrative services as it requires for installation of the project. The Sponsors, at a later date, may request the Soil Conservation Service to administer contracts.

3. Request the assistance of the Cooperative Extension Service, through their agents and specialists, in developing and carrying out the watershed information and education program.

4. Request the cooperation of lending agencies, such as local banks, the Farmers Home Administration, the Production Credit Association, and the Federal Land Bank, to provide loans to help cooperating landowners and operators install needed treatment measures.

5. Provide relocation assistance advisory services, when necessary, to include providing current and continuing information on the availability, prices, and rentals, of comparable decent, safe, and sanitary sales and rental housing; supply information concerning federal and state housing programs, disaster loan programs, and other federal or state programs offering assistance to displaced persons; and provide other advisory services to displaced persons in order to minimze hardships to such persons in adjusting to relocation. These services will be provided without P.L. 566 cost sharing assistance.

6. As a part of project administration, provide personally or by certified or registered first class mail, written notice of displacement, at least 90 days before the displaced persons have to move, and appropriate application forms to each individual, family, business or farm operation to be displaced; assist in filing applications, review and take action on applications for relocation assistance; review and process grievances in connection with displacements; and make relocation payments. The Service will assist in fulfilling these responsibilities.

The Orleans County and the Genesee County Soil and Water Conservation Districts will be responsible for providing assistance to landowners and operators to help them plan, establish, and maintain land treatment measures. The land treatment measures will be installed at approximately uniform annual rates over the 7-year installation period. Installation of similar measures required to meet the total conservation needs will be continued thereafter.

The Soil Conservation Service will:

1. Under the Orleans County and Genesee County Soil and Water Conservation Districts' Memorandums of Understanding with the U. S. Department of Agriculture, provide technical assistance for planning, installing, and maintaining conservation measures.

2. Furnish engineering services for the surveys, layouts, design, and preparation of plans and specifications for the structural measures.

3. Provide for project administration services, including a government representative to administer the expenditure of federal funds, and ensure that all structural measures are installed in accordance with plans and specifications.

The Forest Service will:

Provide guidance and direction to the New York State Department of Environmental Conservation, Division of Lands and Forests, for implementation of the planned forestry treatment.

The New York State Department of Environmental Conservation, Division of Lands and Forests will:

In cooperation with the Forest Service, furnish technical assistance to landowners and others for the determination of needed practices and installation of forest treatment measures.

OPERATION AND MAINTENANCE PROVISIONS

LAND TREATMENT MEASURES

Land treatment measures will be operated and maintained by the landowners and operators. Technical assistance will be provided by the Genesee County Soil and Water Conservation District, the Orleans County Soil and Water Conservation District, and the New York State Department of Environmental Conservation (Division of Lands and Forests), subject to availability of resources. The cost of operating and maintaining about 100 pumping plants for water control will be borne by individual landowners and operators.

STRUCTURAL MEASURES

Annual operation and maintenace cost for the structural measures is estimated to be $28,000. This cost will be borne by the Oak Orchard Creek Small Watershed Protection District by taxing of the beneficiaries. Operation and maintenance to be performed by the district involves mowing the ditches, cleaning the ditches, and repairing dikes.

The Sponsors and the Soil Conservation Service will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. They will jointly determine what maintenance measures are needed. These inspections will continue for 3 years following installation of the structures. Inspection after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service.

An establishment period of 3 years is provided for all structural works of improvement and associated vegetative cover. During this period the Soil Conservation Service may use P.L. 566 funds to cost-share on any repairs or other work resulting from unknown conditions or deficiencies. The cost of repairs will be shared in the same ratio as for the original structure.

Repairs or additional work not eligible for P.L. 566 financial assistance include maintenance work and work resulting from improper operation and maintenance. However, the Soil Conservation Service will provide technical assistance that may be needed in performing any of these tasks.

An operation and maintenance agreement between the Soil Conservation Service and the Watershed Protection District will be executed for each structure prior to the signing of a project agreement. It will include specific provisions for retention and disposal of property acquired or improved with P.L. 566 financial assistance. The agreement will contain a reference to the SCS State Watersheds Operation and Maintenance Handbook. An operation and maintenance plan will be prepared for each structure in accordance with guidelines contained in the handbook.

FINANCING PROJECT INSTALLATION

Federal assistance, financial and other, to be furnished by the Soil Conservation Service in carrying out the project, is contingent on the appropriation of funds for this purpose. Before federal funds are made available, the Sponsoring Local Organization will:

1. Give assurances that all necessary landrights have been secured.

2. Provide for administering the contracts.

3. Execute a project agreement.

Technical assistance funds for forestry activities will be provided through P.L. 566 and the going cooperative forestry programs of the Forest Service and the New York State Department of Environmental Conservation.

The Genesee County and the Orleans County Agricultural Stabilization and Conservation Committees will provide cost-sharing assistance to farmers, in the watershed for installation of land treatment measures in accordance with provisions of the program in effect at the time assistance is provided. The individual landowners will install the pumps, motors, controls and shelters.

The Farmers Home Administration will give special consideration to eligible farm families in the way of credit and farm management guidance to establish the necessary land treatment measures and improve farm income. This assistance may vary over the years as the regulations pertaining to Farmers Home Administration loan programs are altered to meet changing conditions.

A preliminary application has been filed by the Sponsors for a P.L. 566 loan, administered by the Farmers Home Administration, for the costs of the landrights and project administration. The estimated amount of this loan is $375,000. The watershed protection district will have the authority to tax landowners in proportion to benefits received. The district will use this authority to repay the loan obtained from the Farmers Home Administration.

The Orleans County Board of Supervisors and the Genesee County Legislature will provide for expenses incurred in the formation of the Oak Orchard Creek Small Watershed Protection District. The Oak Orchard Creek Small Watershed Protection District will bear the landrights costs associated with the installation of the structural measures. Funds for these establishment expenses and landrights costs will be provided through procedures prescribed in New York State's enabling legislation (County Law). Under provisions of County Law, up to 50 percent of the costs of landrights needed for flood prevention may be reimbursable through New York State funding.

Prior to entering into agreements that obligate funds of the Service, the Oak Orchard Creek Small Watershed Protection District will have a financial management system for control, accountability, and disclosure of P.L. 566 funds received, and for control and accountability for property and other assets purchased with P.L. 566 funds. Program income earned during the grant period will be reported on the Sponsor's request for advance or reimbursement from the Service.

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST

Oak Orchard Creek Watershed, New York

Installation Cost Item	Unit	Number	Estimated Cost (Dollars) 1/ P.L. 566 Funds SCS 3/	P.L. 566 Funds FS 3/	P.L. 566 Funds Total	Other Funds SCS 3/	Other Funds FS 3/	Other Funds Total	TOTAL
LAND TREATMENT 2/									
Land Areas									
Cropland (Upland)	Acres	6,900				504,300		504,300	504,300
Cropland (Muckland)	Acres	2,500				872,200		872,200	872,200
Pastureland	Acres	1,400				112,400		112,400	112,400
Forest Land	Acres	930					89,600	89,600	89,600
Other Land	Acres	600				101,900		101,900	101,900
Technical Assistance			97,000	18,900	115,900	34,900	15,200	50,100	166,000
TOTAL LAND TREATMENT			97,000	18,900	115,900	1,625,700	104,800	1,730,500	1,846,400
STRUCTURAL MEASURES									
Construction									
Channel Work (M) 4/									
Open Channels (Mains)	Miles	18.5	450,000		450,000				450,000
Floodways (Laterals)	Miles	31.8	1,140,000		1,140,000				1,140,000
Floodwater Diversion (Interceptors)	Miles	40.5	865,000		865,000				865,000
Subtotal - Construction			2,455,000		2,455,000				2,455,000
Engineering Services			269,000		269,000				269,000
Project Administration									
Construction Inspection			159,500		159,500	4,000		4,000	163,500
Other			159,500		159,500	31,000		31,000	190,500
Subtotal - Administration			319,000		319,000	35,000		35,000	354,000
Other Costs									
Land Rights						378,000		378,000	378,000
Subtotal - Other						378,000		378,000	378,000
TOTAL STRUCTURAL MEASURES			3,043,000		3,043,000	413,000		413,000	3,456,000
TOTAL PROJECT			3,140,000	18,400	3,158,900	2,038,700	104,800	2,143,500	5,302,400

1/ Price base 1974.

2/ Includes only areas estimated to be adequately treated during the project installation period. Treatment will be accelerated throughout the watershed, and dollar amounts apply to total land areas, not just to adequately treated areas.

3/ Federal agency responsible for assisting in installation of works of improvement.

4/ Type of channel prior to project: (N) - an unmodified, well defined natural channel or stream; (M) - manmade ditch or previously modified channel; (0) - none or practically no defined channel.

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TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT

Oak Orchard Creek Watershed, New York

Measures	Unit	Applied to Date	Total Cost (Dollars)
LAND TREATMENT - MUCK			
Conservation Cropping Systems	Acres	1,600	64,000
Crop Residue Use	Acres	6,038	30,200
Field Windbreak-Hedge	Feet	455,000	68,250
Field Windbreak-Snow Fence	Feet	1,064,780	266,200
Irrigation System-Sprinkler	Number	6	28,000
Irrigation System-Subsurface	Number	43	344,000
Drainage Mains or Laterals	Feet	275,000	206,250
Spoil Bank Spreading	Feet	240,000	48,000
Pumping Plant, Water Control	Number	70	29,000
Subsurface Drain	Feet	970,800	728,100
LAND TREATMENT - UPLAND			
Conservation Cropping Systems	Acres	4,095	163,800
Contour Farming	Acres	225	4,500
Crop Residue Use	Acres	2,910	22,050
Disposal Lagoon	Number	1	3,500
Minimum Tillage	Acres	40	2,000
Diversions	Feet	15,000	4,500
Subsurface Drains	Acres	160,000	112,500
Mulching	Acres	498	9,960
Grassed Waterway	Acres	10	6,000
Irrigation System- Sprinkler	Number	1	8,000
Stripcropping	Acres	285	2,850
Obstruction Removal	Acres	15	15,000
Drainage Mains and Laterals	Feet	30,500	21,080
Spoil Spreading	Feet	16,860	3,370
Pasture, Hayland Management	Acres	315	6,300
Pasture, Hayland Planting	Acres	50	2,500
Deferred Grazing	Acres	46	2,070
Livestock Exclusion	Acres	70	11,200
Proper Grazing Control	Acres	20	1,000
Ponds	Number	18	21,600
Fishpond Management	Number	6	120
Field Border	Feet	500	1,000
Wildlife Habitat Management	Acre	199	4,980
Wildlife Watering Facility	Number	3	1,500
Critical Area Planting	Acres	2	120
Wildlife Wetland Management	Acres	9	230
Tree Planting	Acres	600	27,000
Forest Cultural Operations	Acres	93	700
Recreation Improvement	Acres	95	3,800
Recreation Land Grading, Shaping	Acres	100	50,000
Recreation Trail and Walkways	Feet	250	1,250
Access Road	Feet	100	150
TOTAL			2,326,630

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TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION

Oak Orchard Creek Watershed, New York
1/
(Dollars)

Item	Type of Channel	Installation Cost - P.L. 566 Funds			Installation Cost Other Funds		Total Installation Cost
		Construction	Engineering	Total P.L. 566	Land Rights	Total Other	
Channel							
Open Channels (Mains)- 18.5 miles	M 5/	450,000	59,000	509,000	131,000 2/	131,000	640,000
Floodways (Laterals) 31.8 miles	M	1,140,000	114,000	1,254,000	199,000 3/	199,000	1,453,000
Floodwater Diversions (Interceptors) 40.5 miles	M	865,000	96,000	961,000	48,000 4/	48,000	1,009,000
Subtotal		2,455,000	269,000	2,724,000	378,000	378,000	3,102,000
Project Administration				319,000		35,000 6/	354,000
GRAND TOTAL				3,043,000		413,000	3,456,000

1/ Price base: May 1974
2/ Includes $1,000 for easements, $25,000 for culverts, $28,000 blacktopping, $77,000 gravel surfacing.
3/ Includes $82,000 for easements, $43,000 for culverts, and $74,000 for gravel surfacing.
4/ Includes $16,000 for easements, $20,000 for culverts, and $12,000 for gravel surfacing.
5/ "M" is a type of channel that is manmade or previously modified.
6/ Includes cost of formation of Small Watershed Protection District which includes legal fees of $10,000.

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TABLE 3A - STRUCTURE DATA

CHANNELS

Oak Orchard Creek Watershed, New York

Channel (No. or Name)	Channel Length (ft)	Drainage Area (sq.mi.)	Capacity 3/ Required (cfs)	Capacity 3/ Design (cfs)	Water Surface Elev. 3/ (msl)	4/ Hydraulic Gradient (ft/ft)	Channel Dimensions Bottom Width (ft)	Channel Dimensions Depth of Flow (ft)	Channel Dimensions Side Slopes	Velocities (ft/sec) Aged n=0.045	Velocities (ft/sec) As Built n=0.025 1/	Type of Work	Before Project Type of Channel	Before Project Flow Condition
Open Channels (Mains)												6/	7/	8/
S-0+00	4,500	8.9	676	676	636.4	0.00022	24	8.6	2:1	1.3	1.3	III	M	I
S-45+00	3,500	11.8	772	772	635.6	0.00014	24	8.6	2:1	1.5	1.5	III	M	I
S-80+00	2,500	12.8	797	797	634.7	0.00024	30	-	-	1.7	1.7	III	M	I
S-105+00	3,000	14.1	797	797	634.1	0.00031	30	-	-	1.4	1.4	III	M	I
S-135+00	1,500	22.4	827	827	633.9	0.00013	Natural 2/	-	-	2.1	2.1	III	M	I
S-150+00	3,000	23.0	1162	1162	633.2	0.00017	Natural	-	-	2.1	2.1	III	M	I
S-180+00	6,983	24.8	1502	1502	632.8	0.00036	Natural	-	-	2.9	2.9	III	M	I
SMW-30+00	5,000	31.3	1718	1718	629.7	0.00040	Natural	-	-	2.9	2.9	III	M 11/	I
SMW-80+00	0	32.7	1754	1754	627.4	0.000013	Natural	-	-	0.2	0.2	III	M 11/	I
SMN-0+00	12,500	4.3	191	191	629.9	0.0003	17	9.3	1.5:1	0.6	0.6	III	M	I
Manning														
WMN-0+00					633.2									
WMN-61+00	6,100	7.7	516	516	633.7	0.00016	Natural	-	-	1.8	1.8	III	M	I
WMN-158+00	9,700	6.6	482	482	637.6	0.00045	Natural	-	-	2.4	2.4	III	M	I
WMN-215+00	5,700	5.1	350	350	644.1	0.00116	Natural	-	-	3.5	3.5	III	M	I
WMN-285+00	7,000	3.9	259	259	649.2	0.0007	Natural	-	-	2.4	2.4	III	M	I
Transit														
T-73+00	823	1.8	497	497	636.7	0.00012	12	7.8	1.5:1	0.8	0.8	III	M	I
T-31+70	4,130	1.3	435	435	638.8	0.00015	12	5.9	1.5:1	0.8	0.8	III	M	I
T-81+23					636.4									
T-123+00	4,177	4.0	121	121	636.6	0.00010	12	7.8	1.5:1	0.7	0.7	III	M	I
T-144+00	2,100	3.7	75	75	636.8	0.00014	12	7.4	1.5:1	0.5	0.5	III	M	I
T-180+00	3,600	1.3	45	45	636.8	0.00006	12	6.8	1.5:1	0.4	0.4	III	M	I
T-195+00	1,500	1.3	45	45	636.9	0.00013	12	6.6	1.5:1	0.4	0.4	III	M	I
TE-48+00	4,800	1.0	20	20	638.4	0.00038	3	6.6	1.5:1	0.6	0.6	III	M	I
Floodway No. 1	6,250	0.39	81	81	636.7	0.0002	6	5.7	1.5:1	0.76	1.22	II	M	I
" No. 2	10,000	0.76	27	27	636.5	0.0001	6	6.5	1.5:1	0.25	0.45	II	M	I
" No. 3	2,350	0.19	5	5	628.4	0.0001	3	6.9	1.5:1	0.04	0.08	II	M	I
" No. 4	3,750	0.69	51	51	634.2	0.0001	6	10.2	1.5:1	0.20	0.36	II	M	I
" No. 5	3,900	0.27	7	7	630.0	0.0001	4	8.0	1.5:1	0.02	0.03	II	M	I
" No. 6	1,600	0.17	5	5	629.4	0.0001	4	9.4	1.5:1	0.02	0.03	II	M	I
" No. 7	2,750	0.15	34	34	629.9	0.0001	8	8.0	1.5:1	0.17	0.30	II	M	I
" No. 8	1,700	0.07	13	13	629.9	0.0001	3	9.9	1.5:1	0.06	0.10	II	M	E 9/
Floodwater Div. No. 9	1,800	0.26	8	8	630.1	0.0001	15	6.1	1.5:1	0.04	0.07	II	M	I
Floodway No. 10	2,450	0.19	17	17	630.0	0.0001	10	8.0	1.5:1	0.11	0.20	II	M	I
" No. 11	1,875	0.49	151	151	630.2	0.0001	3	8.2	1.5:1	0.93	1.68	II	M	I
Floodwater Div. No. 12	4,000	0.14	5	5	629.9	0.0001	3	7.1	1.5:1	0.04	0.07	II	M	E
Floodway No. 14	1,250	0.16	9	9	631.3	0.0001	7	7.3	1.5:1	0.07	0.12	II	M	I
" No. 15	1,500	0.08	3	3	631.3	0.0001	3	7.8	1.5:1	0.02	0.04	II	M	I
Floodwater Div. No. 16	2,090	0.06	3	3	631.6	0.0001	3	7.4	1.5:1	0.02	0.04	II	M	I
" No. 17	3,400	0.26	4	4	632.5	0.0001	3	5.7	1.5:1	0.05	0.09	II	M	E
Floodway No. 18	2,075	0.13	7	7	632.0	0.0001	3	11.0	1.5:1	0.03	0.05	II	M	I

TABLE 3A - STRUCTURE DATA

CHANNELS

Oak Orchard Creek Watershed, New York

Channel (No. or Name)	Channel Length	Drainage Area	Capacity 3/ Required	Capacity 3/ Design	Water Surface Elev. 3/	4/ Hydraulic Gradient	Channel Dimensions Bottom Width	Channel Dimensions Depth of flow	Channel Dimensions Side Slopes	Velocities Aged n=0.045	Velocities As Built n=0.025 1/	Type of Work	Before Project Type of Channel	Before Project Flow Condition
	(ft)	(sq.mi.)	(cfs)	(cfs)	(msl)	(ft/ft)	(ft)	(ft)		(ft/sec)				
Floodwater Div. No. 19	1,250	0.05	3	3	633.5	0.0001	3	6.6	1.5:1	0.03	0.05	II	M	E 9/
Floodway No. 20	17,400	1.57	106	106	632.7	0.0002	6	11.7	1.5:1	0.81	1.46	II	M	I
" No. 21	3,200	0.23	10	10	634.9	0.0001	5	6.3	1.5:1	0.09	0.15	II	M	I
" No. 22	925	0.59	90	90	634.9	0.0001	3	9.4	1.5:1	0.44	0.79	II	M	I
Floodwater Div. No. 23	1,200	0.67	10	10	637.4	0.0001	3	5.9	1.5:1	0.11	0.20	II	M	E
Floodway No. 24	5,000	0.52	174	174	636.7	0.0004	5	6.9	1.5:1	1.28	2.30	II	M	I
" No. 25	4,950	0.21	6	6	636.2	0.0007	4	6.4	1:1	0.07	0.13	II	M	I
" No. 26	2,525	0.28	16	16	635.6	0.0001	3	8.0	1.5:1	0.10	0.18	II	M	I
" No. 27	2,400	0.16	27	27	636.9	0.0001	12	7.5	1.5:1	0.12	0.21	II	M	I
" No. 28	7,650	1.37	28	28	636.9	0.0001	8	7.4	1.5:1	0.16	0.28	II	M	I
" No. 29	350	0.03	1	1	634.4	0.0001	8	9.5	1.5:1	0.01	0.01	II	M	I
" No. 30	4,075	0.18	9	9	634.4	0.0001	4	10.4	1.5:1	0.03	0.06	II	M	I
" No. 31	1,250	0.07	3	3	634.8	0.0001	10	6.9	1.5:1	0.02	0.03	II	M	I
" No. 32	1,225	0.06	2	2	634.5	0.0001	4	8.9	1.5:1	0.01	0.02	II	M	I
" No. 33	6,500	0.59	72	72	637.6	0.0002	7	4.6	1.5:1	0.88	1.58	II	M	E
" No. 34	2,000	0.35	48	48	638.1	0.0001	3	5.1	1.5:1	0.69	1.24	II	M	E
" No. 35	4,850	0.24	17	17	636.9	0.0001	4	5.0	1.5:1	0.09	0.17	II	M	I
" No. 36	3,750	0.25	11	11	636.9	0.0001	3	5.2	1.5:1	0.16	0.28	II	M	I
" No. 37	8,375	0.25	25	25	634.6	0.0001	3	9.6	1.5:1	0.12	0.21	II	M	I
Floodwater Div. No. 38	3,000	0.02	2	2	635.1	0.0001	6	6.1	1.5:1	0.02	0.03	II	M	E
Floodway No. 40	3,350	0.17	5	5	636.8	0.0001	10	4.4	1.5:1	0.05	0.10	II	M	I
" No. 41	2,100	0.21	6	6	637.2	0.0001	5	4.0	1.5:1	0.10	0.18	II	M	I
" No. 42	1,850	0.05	6	6	638.4	0.0001	5	3.1	1.5:1	0.16	0.28	II	M	I
" No. 43	3,800	0.62	78 & 35	78 & 35	649.9	0.0001	3	7.9	1.5:1	0.52	0.93	II	M	I
" No. 44	2,000	0.42	35	35	650.8	0.0002	3	5.8	1:1	0.74	1.33	II	M	I
" No. 45	850	0.33	40	40	650.5	0.0002	12	3.5	1.5:1	0.79	1.42	II	M	I
Floodwater Div. No. 46	4,100	0.22	22	22	637.0	0.0001	7	5.2	1.5:1	0.22	0.40	II	M	I
Floodway No. 47	1,600	0.08	5	5	636.4	0.0001	5	4.0	1.5:1	0.09	0.16	II	M	I
Floodwater Div. No. 48	7,500	0.38	12	12	636.9	0.0001	3	3.9	1.5:1	0.27	0.49	II	M	E
" No. 49	1,550	1.03	110	110	631.3	0.0003	4	5.5	1.5:1	0.82	1.47	II	M	E
" No. 50	4,800	0.58	53	53	630.5	0.0001	3	6.5	1.5:1	0.33	0.59	II	M	E
Floodway-Sheelar Rd. (Root Is. Rd.)	2,800	0.15	7	7	636.8	<0.0001	3	5.8	1.5:1	0.43	0.78	II	M	I
Floodway-Hindsburg Rd.	4,450	0.24	35	35	650.4	<0.0001	3	5.4	1.5:1	0.45	0.82	II	M	I
Unnumbered Floodwater Diversion (Interceptor) 10/	213,840	Various	Various	-	Various	Various	3	3	1.5:1	<1.4	<2.0	II	M	E

1/ "n" value for open channels will be reduced to 0.035 by clearing and snagging and will be maintained throughout the life of the project by maintenance.
2/ Natural channel will have low spots in banks filled in to contain floodflow. Natural channel begins at S135+00.
3/ At outlet end of channel.
4/ A hydraulic gradient of 0.0001 is shown for all channels where the actual gradient is less than 0.0001.
5/ Type "II" work is enlargement of an existing channel or stream.
6/ Type "III" work is cleaning out natural or manmade channel.
7/ Type "M" channel is manmade or previously modified.
8/ Type "I" flow is intermittent. Continuous in some seasons and little or no flow during other seasons.
9/ Type "E" is ephemeral, occurring only during periods of surface runoff.
10/ A selected sample of these channels was studied in sufficient detail to use as a basis for overall estimates.
11/ Emergency channel maintenance performed under Section 216 following Hurricane Agnes.

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TABLE 4 - ANNUAL COST

Oak Orchard Creek Watershed, New York

(Dollars) 1/

Evaluation Unit	Amortization of Installation Cost 2/	Operation and Maintenance Cost	Total
All Structural Measures	221,200	28,000	249,200
Project Administration	25,200	-	25,200
GRAND TOTAL	246,400	28,000	274,400

1/ Price base: 1974

2/ 50 years @ 6-7/8 percent.

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TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS

Oak Orchard Creek Watershed, New York

(Dollars) 1/

Item	Estimated Average Annual Damage		Damage Reduction Benefit
	Without Project	With Project	
Floodwater Crop	592,800	88,900	503,900
Indirect	59,300	8,900	50,400
Total	652,100	97,800	554,300

1/ Price base: Adjusted normalized prices (1966)

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TABLE 6 - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Oak Orchard Creek Watershed, New York

(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/		Total Benefits	Average Annual Cost 3/	Benefit Cost Ratio
	Reduction	Secondary			
All Structural Measures	501,500	50,100	551,600	249,200	2.2:1
Project Administration	: : : :	: : :	: : : :	25,200	: : :
GRAND TOTAL	501,500 2/	50,100	551,600	274,400	2.0:1

1/ Price base: Adjusted normalized prices (1966).
2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $52,800 annually.
3/ Price base: 1974

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PRINCIPLES AND STANDARDS PHASE-IN ADDENDUM

Oak Orchard Creek Watershed Work Plan

Genesee and Orleans Counties, New York

INTRODUCTION

This addendum was developed in accordance with phase-in procedures developed by the Water Resources Council for implementation of the Principles and Standards for Level C plans for which field studies, analyses, and evaluations were completed as of October 25, 1973, and which have been formulated in accordance with Senate Document 97 as supplemented and amended, and which are to be transmitted to the OMB before June 30, 1976.

INTEREST RATE

This plan was formulated before October 25, 1973 following the general guidance outlined in Senate Document 97. However, in evaluations an interest rate of 6 7/8 percent as outlined in the Principles and Standards was used. Installation costs are based upon prices being experienced in 1974. Benefits and operation and maintenance costs are based upon adjusted normalized prices. Average annual costs are $274,400 and average annual benefits, including secondary, are $551,600, and the benefit cost ratio is 2.0:1.0. The B:C ratio, excluding secondary benefits of $50,100, is 1.8:1.0.

Using an interest rate of 6 1/8 percent, 1974 prices for installation costs, and adjusted normalized prices for benefits and operation and maintenance costs, average annual costs are $251,100 average annual benefits, including secondary, are $551,600 and the B:C ratio is 2.2:1.0. The B:C ratio, excluding secondary benefits of $50,100, is 2.0:1.0.

THE ABBREVIATED ENVIRONMENTAL QUALITY PLAN

ENVIRONMENTAL CONCERNS

The major environmental concerns in this watershed are:

1. Natural beauty.

2. Quality of water, land and air resources.

3. Biological resources and ecological systems.

4. Geological, archeological, and historical resources.

There are about 45 acres of land being used beyond their capability. There are also 11 acres of land being used as pasture that should have an adjustment in land use due to steepness of slopes.

An estimated 4,500 acres of cropland in the upland areas of the watershed have soil losses exceeding 3 tons per acre per year. About 2,500 acres of the muck cropland are subject to significant wind erosion.

Drainage is needed on approximately 450 acres of muck and 490 acres of upland soils. Lack of proper water management (water level control) on the muck allows for excessive subsidence during dry periods and inhibits root development and release of plant nutrients during periods of high water level.

Land, labor, and capital are being employed inefficiently to forest land where management guidelines are lacking. Trees are being harvested indiscriminately, tree stands need improving, and erosion is occurring on skid trails and access roads.

Erosion, or the wearing away of land surface by running water, wind, ice, or other geological agents, is present throughout the watershed. Erosion occurs in the upland areas as a result of poor management, steep topography, cultural operations, and erosive soils.

Sheet erosion is the removal of a fairly uniform layer of soil from the land surface by runoff water. Sheet erosion rates by land use are shown in the following table.

TABLE C - UPLAND SHEET EROSION
RATES BY LAND USE

Land Use	Tons/Acre/Year
Cropland	1.18-6.40
Open Land Formerly Cropped	0.03
Pastureland	0.31
Forest Land	0.04
Other Land 1/	0.22

1/ Includes roads, farmsteads, urban, and built-up areas.

Moderate roadbank and streambank erosion is occurring in localized situations. It is estimated that 222 miles of roadbank is subject to erosion at an average annual rate of 2.5 tons per bank mile. Ninety-nine miles of streambank erosion is occurring at an average annual rate of 58 tons per bank mile.

The largest measurable source of sediment is sheet erosion of 6.4 tons/acre/year on approximately 4,500 acres of cropland in the upland area. The major factors involved in the high erosion rates are poor cropping sequences with a high amount of row crops and poor tillage practices. Average annual sediment discharge at the mouth of the watershed is approximately 9,800 tons per year. This is equivalent to a sediment concentration of 145 milligrams per liter.

Wind erosion occurs on the muck where proper land treatment measures have not been applied to provide protection. Individual soil particles strike young plants and cut off tender stalks and leaves. Windblown particles deposited on the leeward side of fixed objects smother plants. Fertilizers and pesticides, attached to or absorbed by soil particles, are lost by wind erosion. Soil losses due to wind erosion are estimated at 1/2 inch annually on fields that are not adequately protected.

Intensive upland agriculture in the watershed has brought about the elimination of many hedgerows which provide wildlife cover. This trend toward clean farming will continue to reduce terrestrial small game populations.

OBJECTIVES

The following objectives of the environmental quality plan are to enhance the quality aspects of water, land, and air by control of pollution, prevention of erosion, and restoration of eroded areas in order to harmonize land use objectives in terms of productivity for economic use and development with conservation of the resources.

1. Provide watershed protection to:

    a. Reduce erosion rates of up to 6.4 tons per acre on 4,500 acres of upland cropland to less than 3.0 tons per acre.

    b. Reduce gross sheet erosion on the remaining upland cropland.

    c. Reduce average annual sediment loss to the mouth of the watershed from 9,800 tons to 7,200 tons.

    d. Reduce wind erosion on the muckland.

    e. Reduce fertilizer and agricultural chemical losses resulting from erosion.

    f. Improve water quality through the reduction of stream sediment load.

2. Enhance or maintain existing quality and quantity of fish and wildlife habitat by:

    a. Providing field borders and windbreaks.

    b. Providing wildlife watering facilities.

    c. Providing fish pond management.

    d. Providing upland and wetland habitat management.

    e. Planting trees to speed up successional changes.

    f. Maintaining a diversity of habitat.

3. Protect, enhance, and enjoy archeological, historical, scientific and scenic resources by:

    a. Identifying valuable resources through field survey and research.

    b. Preserving areas of natural scenic beauty, such as wetlands.

    c. Planting trees on open land formerly cropped.

    d. Developing trails and walkways.

COORDINATION

The sponsors, interested local groups, state agencies, Environmental Protection Agency, and U.S. Fish and Wildlife Service have been involved in planning efforts regarding environmental aspects of the project.

The Oak Orchard Creek Watershed Sponsors and the Soil Conservation Service encouraged the participation of interested public agencies and the general public in the planning process by keeping them informed of planning progress and providing them with forums to discuss their respective concerns. The diverse interests expressed by the public agencies and private citizens were considered in the formulation of the project.

A number of coordination meetings, involving representatives of the U. S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, the Soil Conservation Service, and the Sponsoring Local Organization, were held during project formulation. Of particular concern were possible environmental impacts of project measures on the state and national wildlife refuges located immediately downstream from the watershed. An early decision was made to formulate project measures which would not result in consumptive use of water.

The Sponsoring Local Organization, in response to concerns expressed by private citizens, adopted a policy to not accept a project involving the displacement of people, businesses, or farms.

The planning of this watershed has been coordinated with the New York State Office of Parks and Recreation regarding historical and archeological investigations. The New York State Museum and Science Service recommended that an investigation of specific areas to be disturbed be made by an archeologist prior to completion of the plan. This survey was completed in July 1974. Personnel of the Bureau of Sport Fisheries and Wildlife, U. S. Department of the Interior, and the New York State Department of Environmental Conservation made a reconnaissance of the project area with Soil Conservation Service personnel, to coordinate the fish and wildlife aspects of the project. The Environmental Protection Agency has provided an assessment of water quality, and advised Soil Conservation Service personnel during project formulation.

FORMULATION

A land treatment phase is recommended for the environmental quality plan to meet the outlined objectives. The land treatment phase of the plan includes technical assistance and measure installation and applies to each acre in the watershed. The land treatment phase includes continuation of the ongoing technical assistance and measure installation at a rate in existence prior to the formulation of this plan and accelerated technical assistance and measure installation required to meet project objectives. Technical assistance, going and accelerated, will be used to review, revise and update existing conservation and woodland plans, to develop new plans where needed, for soil surveys, resource inventories and for installation of measures. Technical assistance will thus be applicable to any acre in the watershed. Measure installation will be on those acres which require treatment for adequate protection and for changes in use.

Through consensus of the conservation districts, community leaders, landowners, and state and federal agencies, it was agreed that essential land treatment should be applied to 9,400 acres of cropland, to include conservation cropping system, crop residue use, field windbreaks, contour farming, minimum tillage, diversion, mulching, grassed waterway or outlet, and stripcropping; 1,400 acres of pasture, to include pasture and hayland management, fish pond management, deferred grazing, livestock exclusion, proper grazing use, and field border; 930 acres of forest, to include tree planting and cultural operations; and 600 acres of other land, to include pond, recreation trails and walkways, wildlife watering facility, wildlife upland and wetland habitat management, and critical area planting. See Appendix E for definitions of land treatment measures.

IMPLEMENTATION

The proposed Environmental Quality Plan could be implemented through P.L. 566 administered by the Soil Conservation Service. Authorities provided through this act could be used to supplement authorities of the county, state, and federal agencies.

The land treatment phase could be implemented through the Genesee and Orleans County Soil and Water Conservation Districts. Technical assistance could be provided by local, state, and federal agencies through their going programs in accordance with their authorities and responsibilities. P.L. 566 funds might be used by the Soil Conservation Service and the Forest Service to provide accelerated technical assistance. The landowners and operators would finance the cost of installing measures on their land utilizing their usual source of funds with cost sharing assistance available through going conservation programs.

EFFECTS AND IMPACTS

The following effects of the land treatment installation will meet the environmental quality objectives of the sponsors:

1. Annual erosion rates on about 4,500 acres of erosive upland cropland will be reduced from 6.4 tons per acre to less than 3.0 tons per acre.

2. Losses of fertilizer and other agricultural chemicals and losses of crop production, caused by erosion, will be reduced.

3. Annual quantities of sediment delivered to the mouth of the watershed will be reduced from 9,800 to 7,200 tons.

4. Sediment concentration at the mouth will be reduced from 145 mg/l to 107 mg/l.

5. Installation of windbreaks on the muck will reduce wind erosion and associated damages.

6. The planting of 700 acres of trees on open land formerly cropped will speed successional trends to forest land wildlife habitat.

7. Land treatment measures will enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

Investigations conducted (July 1974) by Dr. Marian White (Anthropologist), State University of New York (Buffalo), indicate that there are no historical or archeological materials in the watershed muckland. The National Register of Historic Places lists no properties in the watershed such as historic districts, sites, buildings, structures, or objects which are significant in American history, architecture, archeology, and culture.

DISPLAY ACCOUNTS - SELECTED PLAN

A display of the beneficial and adverse effects are given in the following pages for:

National economic development

Environmental quality

Regional development

Social well-being

OAK ORCHARD CREEK WATERSHED

SELECTED PLAN

NATIONAL ECONOMIC DEVELOPMENT

Components	Measures of Effects 1/	Components	Measures of Effects
Beneficial effects:		Adverse effects:	
A. The value to users of increased outputs of goods and services		A. The value of resources required for a plan	
1. Flood prevention	$501,500	1. Channel work	
2. Land treatment	131,700	Project construction	$221,200
		Project administration	25,200
		O&M	28,000
		2. Land treatment	
		Project construction	$118,500
		O&M	13,200
Total beneficial effects	$633,200	Total adverse effects	$406,100
		Net beneficial effects	$227,100

1/ Average annual values based on 50 years @ 6-7/8 percent interest

OAK ORCHARD CREEK WATERSHED

SELECTED PLAN

ENVIRONMENTAL QUALITY

Components	Measures of Effects
Beneficial and adverse effects:	
A. Quality considerations of land, water and air	1. Erosion rate on upland cropland will be limited to less than 3 tons/acre.
	2. Will reduce the delivery of nutrients and toxic agricultural wastes from the watershed.
	3. Will reduce floodwater damages by about 85 percent.
B. Biological systems and ecological resources	1. Muskrat activity in the channel will be temporarily disturbed during construction.
C. Irreversible and Irretrievable	1. Channel work will eliminate wildlife habitat associated with approximately 39 acres of watershed land.

OAK ORCHARD CREEK WATERSHED

SELECTED PLAN

REGIONAL DEVELOPMENT

Components	Measures of Effects 1/ State of New York	Rest of Nation
Income:		
Beneficial effects:		
A. The value to users of increased output of goods and services		
1. Flood prevention	$501,500	-
2. Land Treatment	131,700	-
B. The value of output to users by region from external economics		
1. Indirect activities associated with increased agricultural production (processing and storage)	50,100	-50,100
Total beneficial effects	$683,300	$-50,100

Components	Measures of Effects State of New York	Rest of Nation
Income:		
Adverse effects:		
A. The value of resources contributed from within the region to achieve the outputs.		
1. Channel work		
Project construction	$26,950	$194,250
Project administration	2,500	22,700
O&M	28,000	
2. Land treatment		
Project construction	118,500	
O&M	13,200	
Total adverse effects	$189,150	$216,950
Net beneficial effects	$494,150	-$267,050

1/ Average annual values based on 50 years @ 6 7/8 percent interest.

OAK ORCHARD CREEK WATERSHED

SELECTED PLAN

REGIONAL DEVELOPMENT

Components	Measures of Effects: State of New York	Measures of Effects: Rest of Nation
Employment:		
Beneficial effects:		
A. Increase in the number and types of jobs		
1. Induced employment in storage and processing, of vegetables, activities	20 man-years of employment annually semi-skilled farm employment	
2. Employment during construction of the project	15.3 man-years of semi-skilled labor will be used during construction	
3. Employment for operation and maintenance of the project	1.5 man-years semi-skilled employment annually	

Net beneficial effects: 21.5 man-years of permanent annual semi-skilled employment.
15.3 man-years of temporary labor during construction.

OAK ORCHARD CREEK WATERSHED

SELECTED PLAN

SOCIAL WELL-BEING

Components	Measures of Effects
Beneficial and adverse effects:	
A. Real income distribution	1. Per capita income in the watershed will increase about $95 as a result of increased agricultural income.
	2. The project will help stabilize agricultural income (economic base).
B. Life, health and safety	1. Will improve the living standards of 100 muckland farm families ~~or~~ about 350 people.

PART II

ENVIRONMENTAL IMPACT STATEMENT

USDA-SCS-EIS-WS-(ADM)-75-2-(F)-NY

OAK ORCHARD CREEK WATERSHED
GENESEE AND ORLEANS COUNTIES, NEW YORK

Environmental Impact Statement

Robert L. Hilliard
State Conservationist
Soil Conservation Service

Sponsoring Local Organizations:

Orleans County Board of Supervisors
Court House, Albion, New York 14411

Genesee County Legislature
County Office Building, Batavia, New York 14020

Orleans County Soil and Water Conservation District
20 South Main Street, Albion, New York 14411

Genesee County Soil and Water Conservation District
17 Masse Place, Batavia, New York 14020

May 1975

Prepared By

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service
Room 400 - 700 East Water Street
Syracuse, New York 13210

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Oak Orchard Creek Watershed Project

Genesee and Orleans Counties

New York State

Prepared in Accordance with
Sec. 102(2) (C) of P.L. 91-190

Summary Sheet

I Final

II Soil Conservation Service

III Administrative

IV Description of Project Purposes and Action

A project for watershed protection and flood prevention in Genesee and Orleans Counties, New York to be implemented under authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended. The project will consist of conservation land treatment measures on 12,050 acres and about 90 miles of channel work.

V Summary of environmental impacts including favorable and adverse environmental effects

Installation of the land treatment measures will reduce agricultural flood damages by about eight percent annually, reduce erosion rates on about 4,500 acres of cropland from 6.4 tons per acre to less than three tons per acre, reduce sediment delivered to the mouth of the watershed by about 2,600 tons annually, and increase efficiencies of production.

Installation of structural measures will reduce annual floodwater damages to 6,560 acres of cropland by 77 percent, eliminate damages from storms up to the 10-year frequency events, and benefit directly about 100 muckland farms or about 350 people.

Installation of the structures will result in the loss of 10 acres of cropland, one acre of open land formerly cropped, and 28 acres of forest land; temporary construction inconveniences; short term increase in sediment; about 90 miles of channel modification; and alter approximately 39 acres of wildlife habitat.

VI List of Alternatives

1. Land Treatment
2. Land Treatment, Pumping Plant, Floodwater Retarding Structures, Structures for Water Control, and Channel Work
3. Land Treatment, Floodwater Retarding Structures, Structures for Water Control, and Channel Work
4. No Project

VII Comments were requested but no response was received during the review of the draft Environmental Impact Statement from the following agencies:

Department of the Army
Department of Commerce
Office of Equal Opportunity - USDA
Federal Power Commission
New York State Planning and Development Clearinghouse(State Clearinghouse)
New York State Office of Planning Services
National Audubon Society
National Resource Defense Council
League of Women Voters

Comments were received from the following:

Department of Health, Education, and Welfare
Department of the Interior
Department of Transportation
Environmental Protection Agency
Advisory Council on Historic Preservation
New York State Department of Environmental Conservation (designated State agency) 1/
Genesee-Finger Lakes Regional Planning Board (Area Clearinghouse)
Orleans Community Action Committee, Inc.
Genesee County Department of Planning
Genesee West Audubon Society
National Wildlife Federation

VIII Draft Statement transmitted to CEQ on September 9, 1974.

1/ Comments from the Department of Environmental Conservation include comments from the State Clearinghouse.

USDA SOIL CONSERVATION SERVICE

ENVIRONMENTAL IMPACT STATEMENT [1/]

for

Oak Orchard Creek Watershed
Genesee and Orleans Counties, New York

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Orleans County Board of Supervisors
Genesee County Legislature
Orleans County Soil and Water Conservation District
Genesee County Soil and Water Conservation District

PROJECT PURPOSES AND GOALS

The Sponsors are aware of society's concern and emphasis for enhancement of the natural resources as a source of present enjoyment and a heritage for future generations. Therefore, the project objective is to enhance environmental quality by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

The following goals are outlined as initially agreed to between the Sponsoring Local Organizations and the Service and subsequently refined during project formulation. The Sponsor's recognize that competing or conflicting uses of the same areas may occur in meeting

---

1/ All information and data, except as otherwise noted, were collected by the Soil Conservation Service and Forest Service, U. S. Department of Agriculture

the stated goals and that the planned project may not provide for all of these stated goals.

1. Provide watershed protection to:

    a. Reduce erosion rates of up to 6.4 tons per acre on 4,500 acres of upland cropland to less than 3.0 tons per acre.

    b. Reduce gross sheet erosion on the remaining upland cropland.

    c. Reduce average annual sediment loss to the mouth of the watershed from 9,800 tons to 7,200 tons.

    d. Reduce wind erosion on the muckland.

    e. Reduce fertilizer and agricultural chemical losses resulting from erosion.

    f. Improve water quality through the reduction of stream sediment load.

2. Reduce agricultural floodwater damages on the 6,560 acres of muckland.

    a. Provide up to a 10-year level of flood protection to the high value vegetable crops growing on the muckland.

3. Reduce the rate of muck subsidence.

4. Enhance or maintain existing quality and quantity of fish and wildlife habitat.

5. Preserve, enhance, and enjoy archeological, historical, scientific, and scenic resources identified within the watershed.

6. Formulate a project which would minimize or avoid the following impacts:

    a. Displacement of people or businesses.

    b. Destroy wildlife habitat.

    c. Increase erosion rates.

    d. Consumptive use of water.

    e. Irreversible or irretrievable commitment of resources.

PLANNED PROJECT

LAND TREATMENT MEASURES

The land treatment phase of the plan includes technical assistance and measure installation and applies to each acre in the watershed. The land treatment phase includes continuation of the ongoing technical assistance and measure installation at a rate in existence prior to the formulation of this plan and accelerated technical assistance and measure installation required to meet project objectives. Technical assistance, going and accelerated, will be used to review, revise and update existing conservation and woodland plans, to develop new plans where needed, for soil surveys, resource inventories and for installation of measures. Technical assistance will thus be applicable to any acre in the watershed. Measure installation will be on those acres which require treatment for adequate protection and for changes in use.

Through consensus of the conservation districts, community leaders, landowners, and state and federal agencies, it was agreed that adequate land treatment should be applied during the 7-year installation period to 9,400 acres of cropland, to include conservation cropping system, crop residue use, field windbreak-hedge, field windbreak-snow fence, irrigation system-sprinkler, irrigation system-subsurface, pumping plant for water control, subsurface drain, contour farming, drainage main or lateral, agricultural waste management system, disposal lagoon, minimum tillage, diversion, mulching, grassed waterway or outlet, holding tank, and stripcropping; 1,400 acres of pasture, to include pasture and hayland management, pasture and hayland planting, pond,

FIGURE 1 - PASTURE BORDERING
WILDLIFE MANAGEMENT AREAS

fishpond management, deferred grazing, livestock exclusion proper grazing use, and field border; 930 acres of forest, to include tree planting and cultural operations; and 600 acres of other land, to include pond, recreation area improvement, recreation land grading and shaping, recreation trail and walkway, access road, wildlife watering facility, wildlife upland habitat management, wildlife wetland habitat management, critical area planting, and mulching. Definitions for land treatment measures are given in Appendix E.

STRUCTURAL MEASURES

Planned structural measures include about 90 miles of channel work and about 100 structures for water control. Location of the structural measures is shown on the Project Measures Map, Appendix B.

Channels

The channel work is generally classified as open channels (mains), floodways (laterals), and floodwater diversions (interceptors). These channels are designed to carry the 10-year frequency storm discharge with an effective design life of 50 years. Backwater effects of the Oak Orchard swamp were considered in evaluating channel capacities.

The floodwater diversions (40.5 miles) will be constructed around the periphery of the muck area to intercept upland flows and divert them into the floodways. The diversions will follow the alignment of existing ditches. Borrow from the channel will be used to construct dikes on the lower side. The materials through which the diversions will be constructed are generally mineral soils (sands and silts).

The 31.8 miles of floodways will carry water from the diversions to the main channels. Existing channel alignment will be used; however, enlargement of the flow area will be necessary.

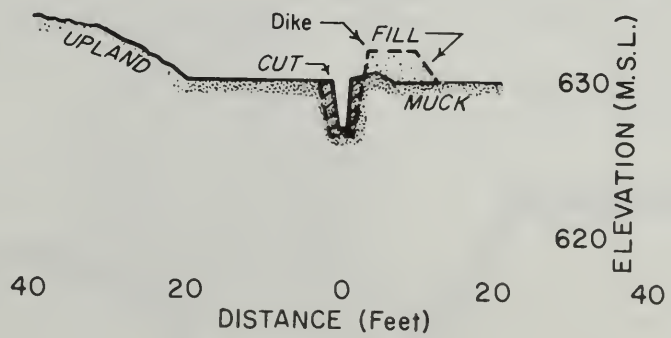


FIGURE 2 - TYPICAL SECTION OF FLOODWATER DIVERSION

Channels will be constructed through soils consisting of muck, with depths varying from 18 inches to 8 feet, overlying mineral soils. The mineral soil, consisting of silts, silty sands, sands, and gravelly sands, will be utilized as borrow to construct low dikes. Excavated muck material will generally be spread on the field side of any road, dike, or spoil bank.

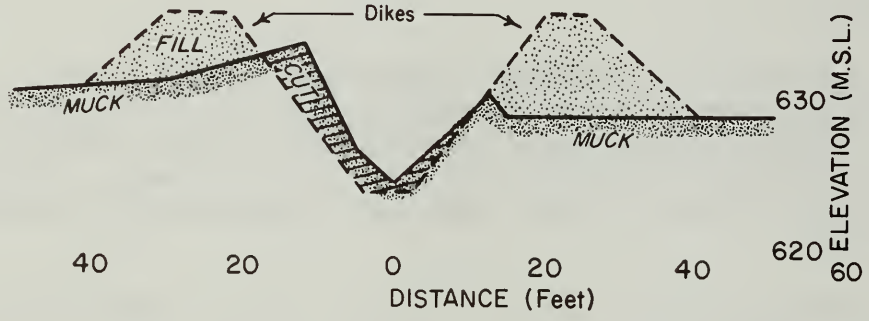


FIGURE 3 - TYPICAL SECTION OF FLOODWAY

Construction of 18.5 miles of open channels (mains) will follow the present alignments of existing manmade ditches. Their capacity will be increased by removal of bars and other obstructions in the channel and by filling low spots along existing travelways and dikes. Channels will be constructed through similar materials as described for the floodways. Excavated material will be sorted, where feasible, with mineral soils to be saved for use in the construction of roadways and dikes. Roadbanks, dikes and spoil areas will be covered with muck soil, where available, to ensure rapid establishment of vegetation to minimize erosion.

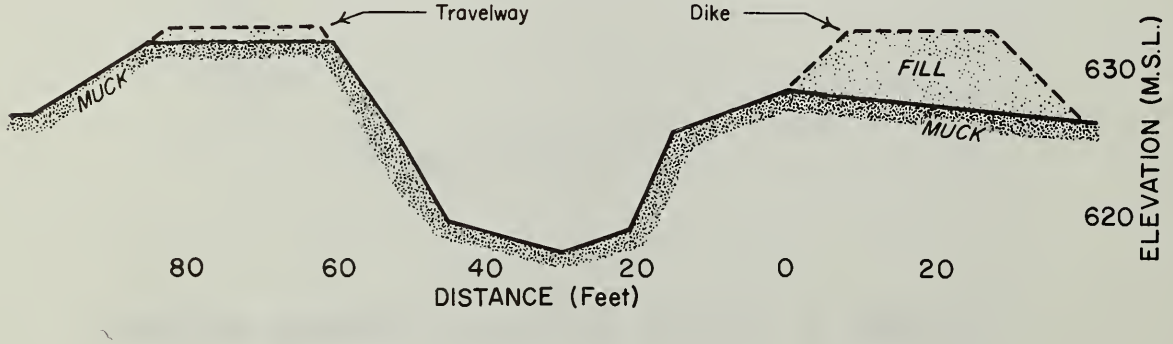
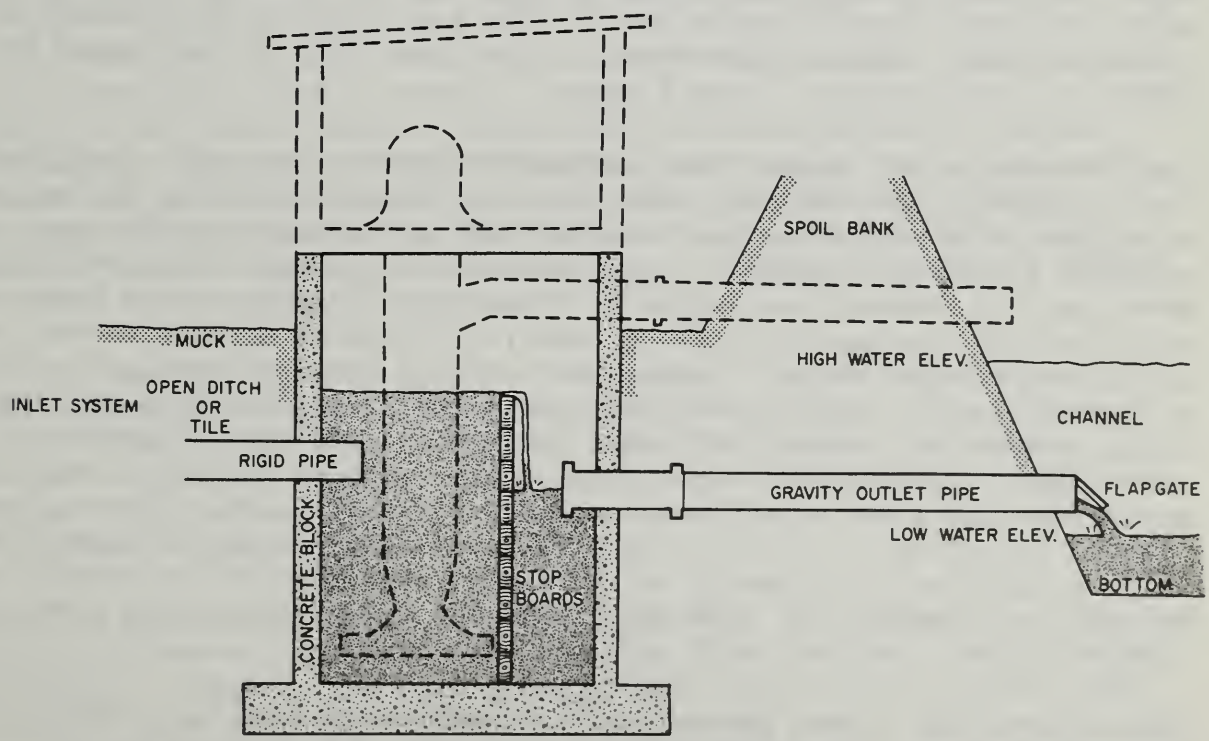


FIGURE 4 - TYPICAL SECTION OF OPEN CHANNEL

Structures for Water Control

Each structure for water control consists of a sump to collect onfarm runoff; a gravity outlet pipe, with flap gate, to provide drainage during periods of low channel flow; a pump, with controls and motor, to be installed by landowners, to discharge onfarm runoff during periods of high channel flow; and shelter and appurtenances necessary for the proper functioning of the structure and protection of the equipment. The structures will be located adjacent to maintained travelways along the proposed channels. Approximately 100 structures will be required, including 70 existing structures which require modification. Pumps will be designed to pump at an average rate equivalent to one inch of runoff per 24 hours.



NOTE: Pump, motor, and shelter installed, operated and maintained by landowner

FIGURE 5 - TYPICAL STRUCTURE FOR WATER CONTROL

GENERAL

The dikes, which are a part of the open channels and floodways, are designed as Class III dikes (SCS Standards and Specifications). They will have one foot of freeboard, back slopes of 2:1, and front slopes of 1 1/2:1. Top widths will be ten feet or greater.

About 9.5 miles of travelway will require resurfacing as a result of channel work. Approximately 1,000 feet will require blacktopping while the rest will have a gravel surface. Construction will require the removal and replacement of about 51 culverts; 43 for field access, and eight for operation and maintenance travelways.

Where channel enlargement is necessary, material will be excavated from one side to preclude total destruction of wildlife habitat. Disturbed areas will be reseeded to adapted grasses and legumes to provide additional wildlife cover.

Channel work will require the acquisition of approximately 675 acres of land. Landrights will be acquired by fee simple title or permanent easement. Present land use is 636 acres of existing channel areas and travelways, one acre of open land formerly cropped, 10 acres of cropland, and 28 acres of forest land. Future use of this area will be for channel and travelways for channel maintenance. Public use will be restricted by gates.

Each contract will require that contractors adhere to strict specifications for minimizing soil erosion, water, noise, and air pollution during construction. The specifications will include provisions for measures, such as sediment basins and temporary vegetation and mulching, to protect exposed areas until permanent vegetation is established. Adherence to state and local health requirements will be required regarding disease vector control, noise, and air pollution. Suppressors will be used to keep dust within tolerable limits. Pollution of surface areas or ground water by chemicals, fuel, lubricants, sewage, and other pollutants will not be permitted. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable state and local laws. A barrier (i.e., plastic filter cloth) will be installed at the very downstream end of the channel improvement while excavation is occurring in the lower 2,500 feet of the channel work in order to minimize the chances of sediment from reaching the downstream fishery.

Requirements for safety and health, in conformance with the Federal Construction Safety Act of 1969 (P.L. 91-54), will be included in each construction contract. Design and construction will comply with applicable state laws. The plan has been coordinated with the Division of Historic Preservation, New York State Parks and Recreation. Investigations to date indicate that the project will not encroach on any historic place or any places planned for historic preservation. If artifacts or other items of archeological or historic significance are uncovered by SCS, or brought to its attention by others prior to or during construction, the State Commission of Parks and Recreation and the National Park Service will be notified. Construction will not begin or continue until appropriate arrangements for survey or salvage have been made.

OPERATION AND MAINTENANCE

Land treatment measures will be operated and maintained by the landowners and operators. Technical assistance will be provided by the Genesee County Soil and Water Conservation District, the Orleans County Soil and Water Conservation District, and the New York State Department of Environmental Conservation (Division of Lands and Forests), subject to availability of resources. The cost of operating and maintaining about 100 pumping plants for water control will be borne by individual landowners and operators.

Annual operation and maintenace cost for the structural measures is estimated to be $28,000. This cost will be borne by the Oak Orchard Creek Small Watershed Protection District by taxing of the beneficiaries. Operation and maintenance to be performed by the district involves mowing the ditches, cleaning the ditches, and repairing dikes. Maintenance activities will be timed to minimize damage to wildlife.

The Sponsors and the Soil Conservation Service will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. They will jointly determine what maintenance measures are needed. These inspections will continue for 3 years following installation of the structures. Inspection after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service.

An establishment period of 3 years is provided for all structural works of improvement and associated vegetative cover. During this period the Soil Conservation Service may use P.L. 566 funds to cost-share on any repairs or other work resulting from unknown conditions or deficiencies. The cost of repairs will be shared in the same ratio as for the original structure.

Repairs or additional work not eligible for P.L. 566 financial assistance include maintenance work and work resulting from improper operation and maintenance. However, the Soil Conservation Service will provide technical assistance that may be needed in performing any of these tasks.

An operation and maintenance agreement, between the Soil Conservation Service and the Watershed Protection District, will be executed for each structure prior to the signing of a project agreement. It will include specific provisions for retention and disposal of property acquired or improved with P.L. 566 financial assistance. The agreement will contain a reference to the SCS State Watersheds Operation and Maintenance Handbook. An operation and maintenance plan will be prepared for each structure in accordance with guidelines contained in the handbook.

PROJECT COSTS

The following table summarizes Public Law 566 and other costs involved in project installation.

TABLE D - PROJECT INSTALLATION COSTS SUMMARY

	P.L. 566	Other	Total
Land Treatment	115,900	1,730,500	1,846,400
Structural Measures			
Construction	2,455,000		2,455,000
Engineering	269,000		269,000
Landrights	0	378,000	378,000
Project Administration	319,000	35,000	354,000
TOTAL PROJECT	3,158,900	2,143,500	5,302,400

ENVIRONMENTAL SETTING

PHYSICAL RESOURCES

Oak Orchard Creek Watershed, located in western New York, consists of about 62 square miles or 39,860 acres. Approximately 45 percent of the watershed is in Genesee County and 55 percent in Orleans County. Portions of five towns comprise the watershed area, which has a population of about 5,900, including the village of Elba (population 750). The population is rural in character; however, Buffalo (population 462,800) and Rochester (population 296,300) are located within 30 miles and the city of Batavia (population 17,400) is located about two miles south of the watershed (26). 1/

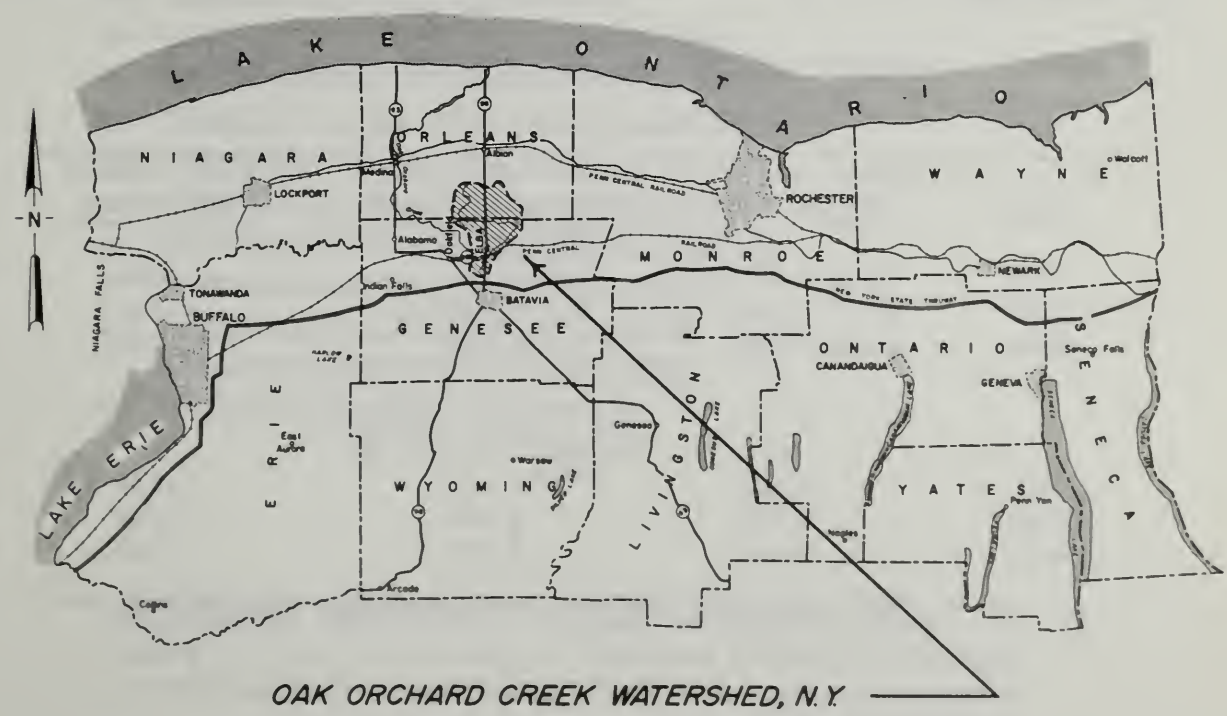


FIGURE 6 - WATERSHED LOCATION MAP

1/ Numbers in parenthesis indicate references appearing in Bibliography

FIGURE 7 - WATER RESOURCE REGION MAP

The watershed is located within the Water Resources Council's Great Lakes Water Resource Region and the Southwestern Lake Ontario Subregion (Figure 7, Water Resource Region Map). Table E illustrates present and projected population and per capita incomes for the region, subregion and watershed.

TABLE E - WATER RESOURCE REGION PROJECTIONS

Year	Great Lakes Region 1/	Southwestern Lake Ontario Subregion 1/	Oak Orchard Watershed
		POPULATION	
1970	28,853,156	1,015,051	5,900
1980	33,727,400	1,276,600	7,400
2000	44,050,800	1,908,000	11,100
		PER CAPITA INCOME	
1970	3,826	3,872	3,149 2/
1980	5,241	5,348	4,349
2000	8,932	9,059	7,367

1/ U.S. Water Resources Council: 1972 OBERS PROJECTIONS: Regional Economic Activity in the U.S., Vol. 3, Water Resource Regions 1-8, U.S. Government Printing Office, Washington, D.C.

2/ U.S. Bureau of the Census: Census of Population: 1970 GENERAL SOCIAL AND ECONOMIC CHARACTERISTICS, Final Report PC(1)-C34 New York: U.S. Government Printing Office, Washington, D.C.

The watershed is within the Ontario-Mohawk Plain Resource Area of the Lake States, Fruit, Truck, and Dairy Land Resource Region (2) and the Erie-Ontario Plain Physiographic Region of New York State (4). The watershed is representative of these regions.

The primary soil and water resource problem is about 6,560 acres of muckland subject to periodic inundation. (See Project Map, Appendix B.) The present channels in the problem area are adequate in depth and capacity for drainage purposes. However, excess runoff from the upland areas flood the muck on an annual basis. Erosion damage is occurring on steep cropland. The muckland is damaged by wind erosion, and water level control is needed to control subsidence.

The climate is humid continental (12). The average growing season rainfall is 14 inches (5) which is 45 percent of the mean annual 32 inch precipitation. Summers are relatively cool with an average July temperature of 69 degrees Fahrenheit. Winters are moderately cold with an average January temperature of 25 degrees. The average annual temperature is 46 degrees with extremes having ranged from -21 degrees to 100 degrees (12). The growing season lasts about 150 days and has a mean temperature of 63 degrees. Figure 8 illustrates monthly precipitation distribution.

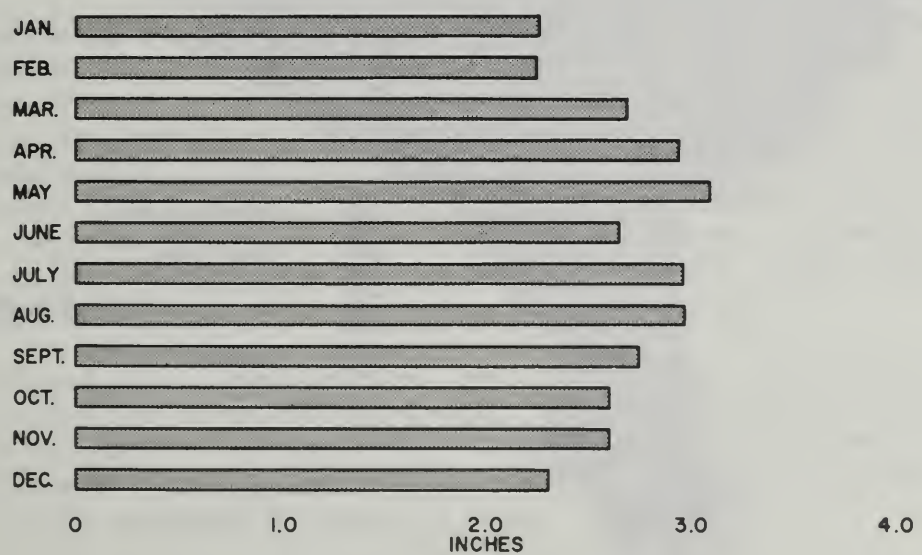


FIGURE 8 - MONTHLY PRECIPITATION DISTRIBUTION

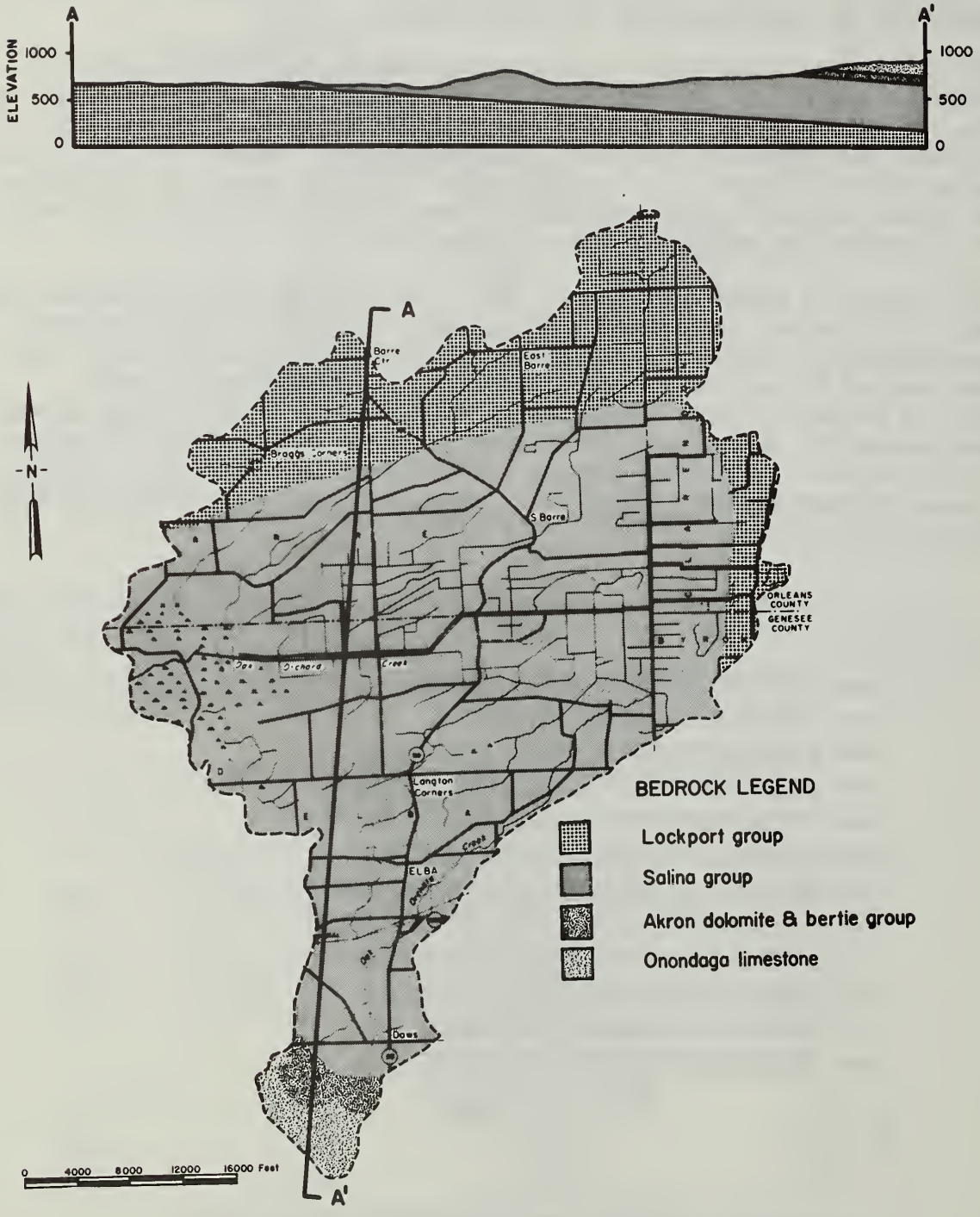


FIGURE 9 - GENERALIZED GEOLOGIC MAP AND CROSS SECTION

Bedrock is predominantly shale and limestone, with scattered beds of dolomite and gypsum. (See Figure 9 , Generalized Geologic Map and Cross Section.) Average depth to rock, below ground surface, ranges from 20 to 30 feet; however, surface exposures are present near the Manning Muck (Project Map, Appendix B.). Depth to bedrock in the problem area averages 40 feet.

Topography is flat to gently rolling with elevations ranging from 600 to 700 feet above mean sea level over most of the area. One exception is on the southern divide where the ground slopes gently upward to a maximum elevation of 930 feet.

Soils are either of glacial or organic origin. The dominant soils in the upland are in the Ontario-Hilton Association. These are well to moderately well drained, medium-textured, high lime soils which developed from glacial till. They occur on rolling landforms in the northern, eastern and southern sections of the watershed.

Soils in the southwest and western portions are of the Cazenovia-Ovid and Collamer-Galen Association. They are moderately well-drained to somewhat poorly drained, medium to fine textured, calcareous soils of glacial till and lake-laid sediments. The wet, fine textured, high lime Odessa-Lakemont Soil Association is dominant in the northwest.

Muck (organic) soils occur along Oak Orchard Creek. The formation of the organic soils is the result of a receding glacial lake. This lake was originally formed by a restriction in the outlet which could have been the result of bedrock outcroppings, deposits of glacial material, or a combination of both. The lake was gradually filled by the deposition of sediment originating from the surrounding uplands, leaving a shallow swamp. Natural processes of eutrophication ensued. Decaying organic matter in this swamp produced the muck soils which, upon clearing and draining, became suitable for agricultural purposes.

The muckland in the problem area was cleared and developed for agricultural production about 50 years ago. It was necessary to install drainage systems because the natural high water table would not permit the production of crops. See Appendix E, Oak Orchard "A Wildlife Haven" by NYS Environment, December 1, 1974.

In 1973, following Hurricane Agnes, sediment, silt, and debris was removed from the lower end of the Oak Orchard Creek channel (from the East boundary of the Oak Orchard Wildlife Management Area to a point 8,000 feet upstream) as authorized under Section 216, Flood Control Act of 1950. This action was deemed necessary to provide immediate protection from flooding by returning the channel capacity to pre-Agnes condition. Approximately one foot of sediment, silt, and debris were removed from the channel bottom. The contract cost for channel excavation, spoil spreading, and seeding was approximately $41,000.

Surface subsidence of muck soil occurs as a result of soil shrinkage by oxidation and compaction and direct soil loss by erosion and burning. Shrinkage is increased with uncontrolled drainage. Lowering of the water table permits entry of air into the soil pores. Oxidation of the organic soil by action of aerobic bacteria converts such matter to carbon dioxide, which escapes into the atmosphere, and water. The removal of water by drainage causes the weight of upper soil layers to compact lower layers. The operation of farming equipment in preparing and compacting seedbeds consolidates surface layers by pulverizing aggregates of soil particles and eliminating larger soil voids.

Observation of many sites over many years in both the United States and Europe indicates an overall subsidence of about one inch per year and that this rate varies directly with the depth of organic material exposed above the water table. Higher initial rates of subsidence occur within the first several years after drainage. These higher rates are attributable primarily to initial compaction which may be two or three times the average subsidence occurring in later years.

Land capability classification (22), is a system by which soils are grouped together by classes and subclasses, based on their limitations and hazards for agricultural use. Capability classes are designated by Roman numerals with limitations in use becoming progressively greater from Class I through Class VIII. Soils in the first four classes under good management are capable of producing adapted plants, such as forest

TABLE F - PRESENT LAND USE

	CAPABILITY SUBCLASS 4/										
1/ Land Use	I Acres	IIe Acres	IIw Acres	IIIe Acres	IIIw Acres	IVe Acres	IVw Acres	VIe Acres	VIIe Acres	Total	Percent
Cropland - Upland	273	6,946	1,175	632	3,963	340	264	9	36	13,638	34.2
Muck					2,624		3,936			6,560	16.5
Open Land Formerly Cropped	15	1,443	266	183	1,393	116	1,752	14	4	5,186	13.0
Pastureland	2	625	103	55	514	44	266	0	11	1,620	4.1
Forest Land 2/	10	870	232	242	1,622	128	4,393	131	123	7,751	19.4
Urban Land	23	814	166	80	289	49	151	0	17	1,589	4.0
Other Land 3/	11	756	135	132	639	34	1,463	275	71	3,516	8.8
TOTAL	334	11,454	2,077	1,324	11,044	711	12,225	429	262	39,860	100.0

1/ Cropland - Land which is used for row crop, close-grown field crops, fallow, rotation hay and pasture, and hayland.
Open land formerly cropped - Land which formerly had grown agricultural crops but is now undergoing natural plant succession.
Pastureland - Land producing forage plants for animal consumption.
Forest land - Land at least 10 percent stocked or formerly stocked by forest trees, noncommercial trees, and afforested (plantations) areas.
Urban land - Built-up areas, industrial and commercial sites, etc.
Other land - Includes farmsteads, farm roads, feedlots, ditch banks, fence and hedgerows, marshes, and recreation areas.
2/ Includes 2,129 acres of Type 7 Wetland.
3/ Includes 165 acres of Types 3, 4, 5, and 6 Wetland.
4/ Capability classes V and VIII do not occur in this watershed.

trees or range plants, and the common cultivated field crops and pasture plants. Soils in classes V, VI, and VII are suited to the use of adapted native plants. Some soils in classes V and VI are also capable of producing specialized crops, such as certain fruits and ornamentals, and even field and vegetable crops under highly intensive management involving elaborate practices for soil and water conservation. Soils in class VIII do not return on-site benefits for inputs of management for crops, grasses, or trees without major reclamation.

Capability subclasses are a grouping of units having similar kinds of limitations and hazards. Four general kinds of limitations or hazards are recognized: e - erosion, w - wetness, s - rooting zone limitations, and c - climate. Soils in the watershed have been grouped by land use into capability subclasses as shown in Table F, Present Land Use.

Forest land is defined as land which is at least 10 percent stocked by forest trees, and is capable of producing either timber or other wood products or exerting an influence on the water regimen. It has been determined that 4 percent of the forest land is presently in poor, 18 percent in fair, and 78 percent in good, hydrologic condition. Most of the forest soils are classified as poorly drained. Types of forest stands and plant communities are identified in Table G.

About 19 percent of the forest area contains sawtimber stands with 1,500 board feet or more per acre. Sixty-one percent of the forest stands are classed as pole size and 20 percent as seedlings or saplings.

Adequate forest fire protection is provided by local volunteer fire departments. There have been no forest fires during the past five years.

General plant communities that provide wildlife habitat are shown in Table G. The upland portion of the watershed (upland habitat area) is devoted to intensive, clean tilled crop production. Hedgerow removal is rapidly eliminating all but boundry line hedgerows. Woody vegetation is found only in small isolated lots unsuited for agriculture. Composition on the better drained soils is commonly woodlots of the northern hardwood association. The poorly drained depressions are vegetated with a variety of wetland types (see Table L). Typical species include cattails, red-osier dogwood, willow, aspen, white ash, elm, and red maple.

Located within the upland habitat region, adjacent to the muck, are extensive stands of forest land. Elm, soft maple, and white oak are the predominant species of the cutover stands. Stands of an early stage of succession are found in this area. Cottonwood and aspen mixed with a variety of pole-size hardwood reproduction are typical species.

TABLE G - PLANT COMMUNITIES

Area	Acres	Vegetation
Upland Habitat Area		
Cropland	13,638	Rotation of grasses, legumes, and grains - Alfalfa timothy, corn, rye, and wheat
Pastureland	1,620	Domestic grasses - Bluegrass and timothy Native plants - Canada thistle, dandelion, bull thistle, crabgrass
Open Land Formerly Cropped	3,726	Herbaceous - Wild grasses and annual and perennial weeds - goldenrod, bristly foxtail, crabgrass, curled dock, late purple aster, etc. Woody - Dogwood, thornapple, raspberries, sumac, etc.
Forest Land	5,622	59% - Northern Hardwood Association - beech, hard maple, soft maple, basswood, white oak, ash, red oak, elm, and black cherry 22% - Elm, soft maple, white oak 15% - Cottonwood and minor amounts of hardwoods 4% - Oak and hickory
Upland Wetlands		
Type 3	37	Inland shallow fresh marshes - cattails, bulrushes, and arrowheads
Type 4	20	Inland deep fresh marshes - pondweeds, water lillies, coontail, etc.
Type 6	20	Shrub swamps - alders, buttonbush, dogwoods, etc.
Type 7	896	Wooded swamps - willow, red maple, elm, etc.
Urban and Other	4,940	Ornamental grasses, trees, and shrubs
Bottomland Habitat Area		
Cultivated Muck Cropland	6,560	Vegetable crops - onions, celery, and lettuce - fields are bordered by privet and willow hedges
Open Land Formerly Cropped	1,460	Herbaceous - Goldenrod Woody - Willow, ash
Bottomland Wetlands		
Type 3	20	Inland shallow fresh marsh - cattails, bulrushes
Type 5	15	Inland open fresh water - pondweeds, naiads, wild celery, coontail, water milfoils, etc.
Type 6	55	Shrub swamp - buttonbush, alder, dogwoods, etc.
Type 7	1,231	Wooded swamps - willow, red maple, elm
Total	39,860	

The privately-owned, cultivated muck is an intensively cropped area broken by a grid of drainage ditches and interspersed with former cropland and woodland. Intensive farming has eliminated most natural vegetation. Plantings of privet and willow hedges serve as windbreaks throughout the area.

West of the cultivated muck is an area of wooded wetlands. This area is not suited for agriculture and thus retains native vegetation. The area also represents the largest continuous area of forest land in the watershed.

Ground water resources are generally adequate for rural domestic use. Upland aquifers are generally glacial till or bedrock with a low yield of 4 to 12 gallons per minute (gal/min). Low yield wells are used primarily for domestic and agricultural uses. Gravel aquifers scattered throughout the muckland yield from 200 to 600 gal/min. Well depths range from 30 to 110 feet. High yield wells, on the muckland, are used for irrigation; however, the supply is not adequate for irrigation of the entire area.

The quality of the ground water is generally acceptable for present uses with the exception of water from bedrock of the Salina formation, which may be highly mineralized (10).

Gypsum deposits are being mined in the vicinity of the watershed. Sand and gravel deposits exist; however, only one pit is in commercial production.

Oak Orchard Creek originates as a natural channel in the upland, south of Elba. Flowing northeastward, it enters the Elba muck near Transit Road. From Transit Road it flows north in a manmade channel to the Genesee-Orleans County line. The manmade channel continues westward along the county line to provide outlets for the vast number of laterals and floodways that traverse the muck. Near the center of the muckland, Oak Orchard Creek is joined by the Manning tributary, a manmade channel providing a water course for the northeast portion of the watershed. At the confluence of the two streams, the channel is directed southwest for about 3,500 feet before continuing westward to enter the Oak Orchard Swamp near the western watershed boundary.

From the watershed boundary, Oak Orchard Creek continues westerly through the Oak Orchard Wildlife Management area and the Iroquois National Wildlife Refuge. Turning northward, it flows as a natural stream through the village of Medina, through Glenwood Lake (about 90 acres), continuing through Waterport Pond to its mouth at Lake Ontario.

Table H provides a description of Oak Orchard Creek flood plain use and water quality, from its source to Lake Ontario.

TABLE H- GENERAL DESCRIPTION OF OAK ORCHARD CREEK FROM SOURCE TO LAKE ONTARIO 1/

Location of Stream	Character of Reach	Condition of Waters	Present Usage	Best Usage	Class 2/	Comments
From source to east boundary of refuge 3/	Residential, farmland, swampland, woodland, and industrial	Natural to slightly polluted	Agriculture, sewage and industrial wastes disposal	Agriculture	D	Flows through Oak Orchard swamp. Drains muckland. Receives sewage and industrial wastes at the village of Elba.
From east boundary of refuge to east Shelby Road	Game refuge, swampland	Natural	Wildlife Preservation	Wildlife Preservation	C	Flows through game refuge.
From Wheatville east Shelby Road to Shelby Mills Pond	Farmland, woodland and swampland	Natural	Agriculture	Agriculture	D	Drains Oak Orchard swamp
From Shelby Dam to Barge Canal 4/	Residential, farmland and woodland	Slightly polluted	Agriculture domestic water supply and sewage disposal	Agriculture	D	Receives sewage at the hamlet of Shelby and the village of Medina. Used as source of domestic water supply.
From Barge Canal to mouth of Oak Orchard at Lake Ontario	Cottage development, residential, industrial farmland, woodland, and orchards	Moderately polluted to polluted	Fishing, agriculture, industrial water supply, sewage and wastes disposal. Boating, power & development	Fishing	C	Cottage developments at mouth and along stream. Sewage and waste discharges at Medina. Receives water from Barge Canal.

1/ From the Lake Ontario Drainage Basin Survey Series Report No. 4, Lake Ontario INCL. Specified Tributaries N.Y.S. Dept. of Health, Water Pollution Control Board, April 1958.

2/ Tributaries and subtributaries to these streams, including channels draining the muckland, are classed D. Streams classified by Water Pollution Control Board, New York State Department of Health.

Definitions of water quality classifications for best usage are as follows:

Class C: Fishing and any other usages except for bathing or as source of water supply for drinking, culinary, or food processing purposes.

Class D: Agricultural or source of industrial cooling or process water supply and any other usage except for fishing, bathing, or as source of water supply for drinking, culinary, or food processing purposes.

3/ Watershed located entirely within this reach.

4/ The lowest flow at the bridge on New York Route 31A south of Medina, was one cubic foot per second. The drainage area above this point is 157 square miles.

Figure 10 shows habitat areas, stream designations, and wetland locations. Table I provides a physical description of stream reaches located within the watershed. Wetlands are listed by type in Table L.

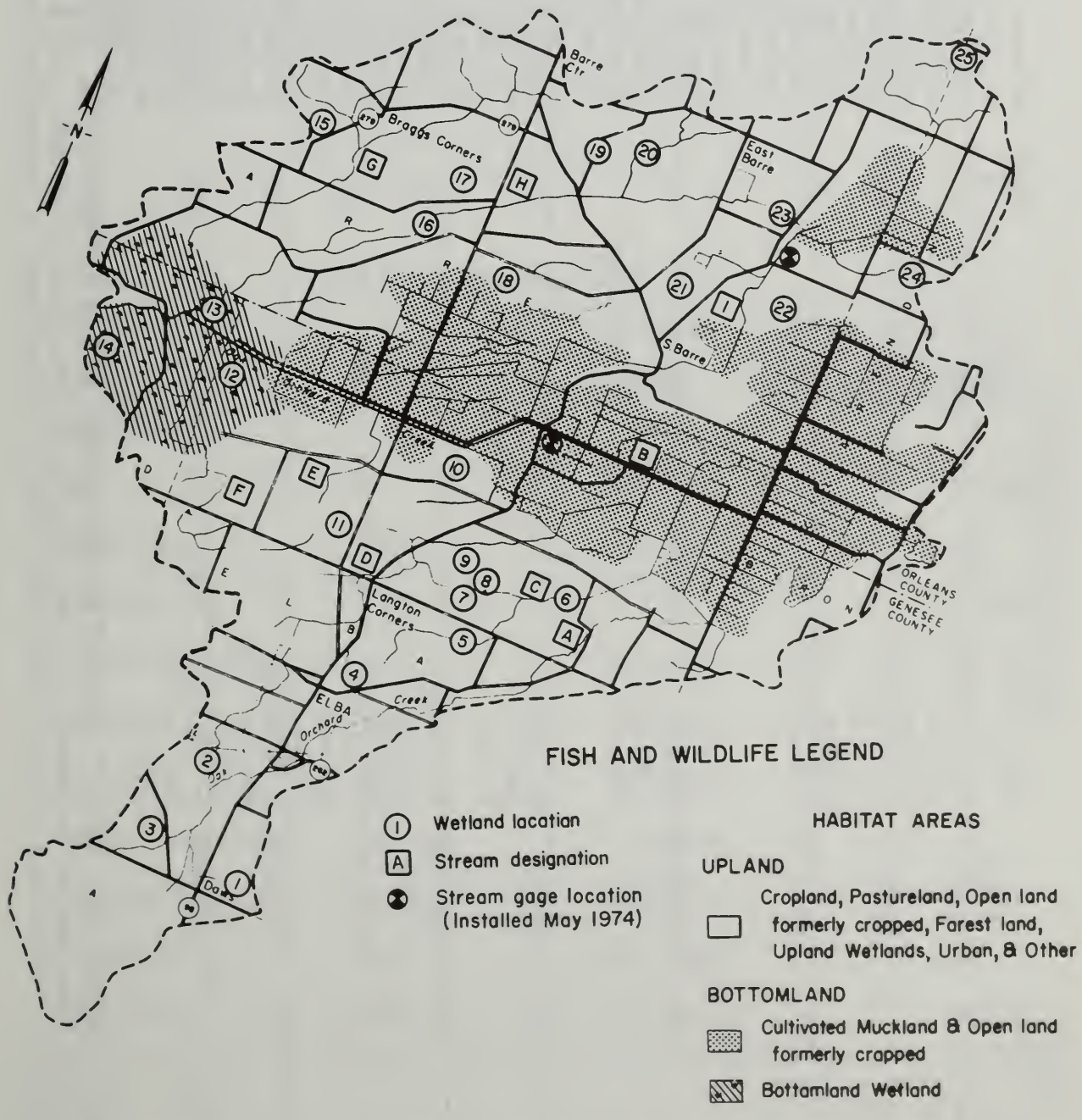


FIGURE 10 - FISH AND WILDLIFE HABITAT RESOURCE MAP

TABLE I - PHYSICAL CHARACTERISTICS OF WATERSHED STREAM

Designation	Stream Name	Stream Length (Mi.)	Physical Characteristics Channel	Pool/Riffle %	Width (Ft.)	Depth (In.)	Bed Material	Shade %	Adjacent Land Use (%) 3/	Sport Fisheries
A	Oak Orchard	8.4	Natural	No definite 1/ pools or riffles	12	22	Silt	30	Cropland-80 Wetland-13 Forest Land-7	None
B	Oak Orchard		Modified	No definite pools or riffles	18	26	Silt	50	Cultivated Muck-70 Forested Muck-5 Wood Wetlands-25	Warm Water 2/
C	-	4.5	Modified	100% riffles	2	7	Clay and gravel	10	Cropland-50 Wetlands-15 Forest Land-5 Cultivated Muck-15 Forested Muck-15	None
D	-	6.9	Modified	Pools-8 Riffles-56 Flats-36	9 5 7	14 9 9	Pool-Flats Silt Riffles-Gravel	10	Cropland-60 Forest Land-5 Cultivated Muck-15 Forested Muck-5 Wetlands-15	None
E	-	2.0	Natural	No definite pools or riffles	6	11	Silt	50	Cropland-20 Wetland-50 Cultivated Muck-10 Forested Muck-20	None
F	-	3.8	Modified	No definite pools or riffles	5	7	Silt	100	Cropland-35 Forest Land-10 Wetlands-55	None
G	-	10.0	Natural	No definite pools or riffles	14	21	Silt	100	Cropland-93 Forest Land-5 Wetland-2	None
H	-	9.5	Natural	No definite pools or riffles	16	13	Silt	100	Cropland-70 Forest Land-20 Wetland-10	None
I	Manning	7.6	Modified	No definite pools or riffles	18	23	Silt	100	Cropland-18 Forest Land-40 Wetland-2 Cultivated Muck-40	None

1/ Flat gradient produced even depths. Some fish shelter provided by logs and water depth.
2/ New York State Department of Environmental Conservation survey data (Appendix E) shows only a warm water fishery existing within the watershed located in Oak Orchard Creek at Fisher Road. No population data is available.
3/ See Appendix E.

Water quality of Oak Orchard Creek, above Elba Muck, has been monitored by the Rochester Field Office of the Environmental Protection Agency (EPA). Water samples were collected and processed on a monthly basis from July 1969 through June 1970 (except September 1969 and February 1970). The data collected are shown in Table J.

In May 1974, the United States Department of the Interior, U.S. Geological Survey installed two recording gages (Figure 10 for locations) to monitor stream flow.

TABLE J - WATER QUALITY DATA

Item	Units	Range	Average
Temperature	°C	0-22	-
pH		7.1-8.7	7.5
Alkalinity	mg/1	75-303	192
Turbidity	JTU	1.7-45	12.8
Dissolved oxygen	mg/1	4.5-15.2	10.9
Ammonia	mg/1	0-.46	.21
Nitrates	mg/1	.13-4.45	1.8
Organic nitrogen	mg/1	.16-3.29	1.4
Phosphates	mg/1	.03-3.10	.64
Solids-Total	mg/1	284-1508	764
Calcium	mg/1	41.2-221.6	116.2

Table K shows quantities of fertilizer, herbicide, pesticide, and fungicide normally applied to muck and upland cropland. After a flood, the muckland requires an additional application of about 12,000 pounds of herbicide to control weed growth resulting from germination of seeds carried in by floodwater. An additional 90 tons of fertilizer is needed to replace that which is washed away by the floods.

TABLE K - ANNUAL APPLICATION OF AGRICULTURAL CHEMICALS

Item	Quantity	Unit
Muck (6,560 acres)		
Fertilizer		
Nitrogen (N)	295	Tons
Phosphate (P_2O_5)	295	Tons
Potash (K_2O)	295	Tons
Herbicide	24,000	Pounds
Pesticide	13,000	Pounds
Fungicide	10,000	Pounds
Upland Cropland (13,638 acres)		
Fertilizer		
Nitrogen (N)	856	Tons
Phosphate (P_2O_5)	392	Tons
Potash (K_2O)	647	Tons
Herbicide	24,000	Pounds
Pesticide	4,900	Pounds
Fungicide	2,500	Pounds

The Environmental Protection Agency analyzed two samples of stream bottom sediment collected in June 1974. The samples contained significant concentrations of lead and zinc, as well as dichloro-diphenyl (DD) compounds. Since EPA has banned the use of the DD compounds for agricultural purposes in the eastern states, it is expected that these concentrations will diminish overtime. See the EPA's Oak Orchard Survey report (Appendix F) for a description of the survey and a listing (and concentrations thereof) of chemicals and organisms identified in the samples.

The watershed contains a total of 2,294 acres of wetlands. Table L provides data relative to the sizes and types of these wetlands.

TABLE L - WETLANDS OF THE WATERSHED (10 ACRES OR GREATER)

Wetland 1/ Number	Total Acres	Acres by Wetland Type 2/					
		3	4	5	6	7	
1	31	8			3	20	
2	31				3	28	
3	25		12		3	10	
4	10					10	
5	37					37	
6	25					25	
7	25					25	
8	33					33	
9	18					18	3/
10	124					124	
11	336					336	
12	710	20		15		675	
13	361				25	336	
14	716				30	220	4/
15	12					12	
16	37	34			3		
17	37					37	
18	44					44	
19	18					18	
20	18					18	
21	56					56	
22	18					18	
23	18				4	14	
24	10				5	5	
25	630					10	5/

1/ Numbers indicate wetlands located on Figure 10 - Fish and Wildlife Habitat Resource Map.

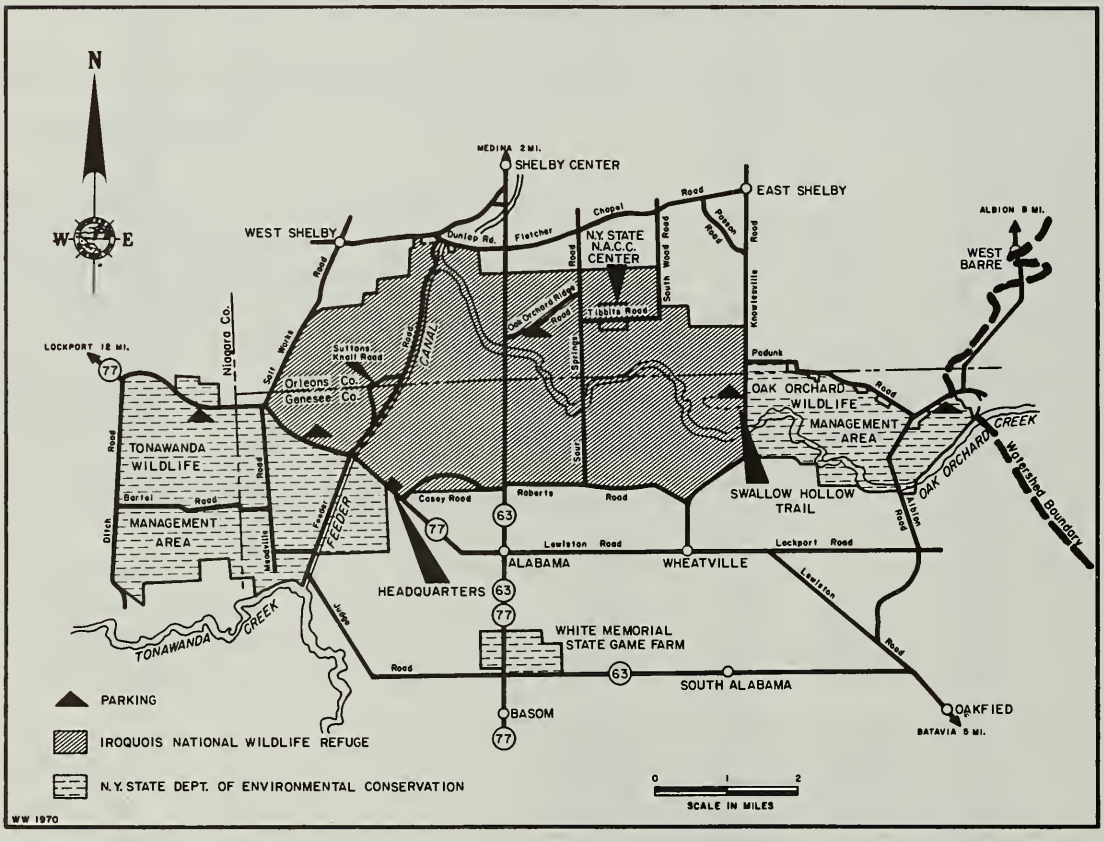
2/ Wetlands listed by types as defined in Appendix E. It should be noted that small inclusions of other types may be associated with the wetland listed but were not separated due to size.

3/ Although previously cleared, this area is in the early stage of Type 7.

4/ Additional 466 acres of Type 7 outside the watershed. Adjacent to this is another wetland of 828 acres which adjoins the refuge.

5/ Additional 620 acres of Type 7 outside the watershed.

Adjoining the western boundary of the watershed are three public wildlife management areas. These areas include the Oak Orchard Wildlife Management Area (2,500 acres); Iroquois National Wildlife Refuge (10,800 acres); and the Tonawanda Game Management Area (5,500 acres).



(Courtesy of United States Department of the Interior, Bureau of Sport Fisheries and Wildlife, Iroquois National Refuge)

FIGURE 11 - WILDLIFE REFUGE MAP

Resting and feeding areas attract thousands of Canada geese and a variety of other migratory waterfowl. The area also attracts an increasing number of people interested in bird watching, nature study, photography, and general outdoor recreation.

Impoundments constructed throughout the three management areas serve as resting areas for the migratory waterfowl. These wildlife management areas rely on spring floodwaters of Oak Orchard Creek to fill their impoundments. They are recharged in the fall by water pumped from Oak Orchard Creek. An estimated 14,000 acre-feet of water in the spring and 6,600 acre-feet of water in the fall is needed to fill impoundments.

FIGURE 12- TYPICAL WATERFOWL IMPOUNDMENT

PLANT AND ANIMAL RESOURCES

Wildlife species have diverse requirements and occupy a vast variety of niches in the ecosystem. However, species may be generally grouped by main habitat into forest wildlife, open land or agricultural wildlife, and wetland wildlife. See Figure 10, Fish and Wildlife Habitat Resource Map. Table M shows estimated wildlife population densities, by habitat, in the watershed area.

Forest wildlife species are those which find both food and cover within the forest, although they may venture into open land to feed. Factors affecting the density of these species may include woodlot size, density of humans, and vegetative compositon, by type and successional stage. These factors, in conjunction with climatic conditions, determine species range. Habitat throughout the watershed is not highly suited for the production of forest wildlife. The small woodlots in the upland habitat area do not provide adequate cover for high densities. These areas also have soils poorly suited for the production of forage and cover. Low to moderate populations of forest wildlife exist, particularly in the band

TABLE M - ESTIMATED WILDLIFE POPULATIONS[1/]

Species[2/]	Density
Forest Wildlife	
Whitetail Deer	Moderate (3 per 100 acres)
Ruffed Grouse	Low (1 per 40 acres)
Gray Squirrels	Low (1 per 10-20 acres)
Open Land Wildlife	
Pheasant	High (1 per 5 acres)
Cottontail Rabbits	Moderate (1-2 per 10 acres)
Raccoon	High (1 per 5-10 acres)
Wetland Wildlife	
Muskrat	High (20 per acre)
Mink	High (Unknown)
Woodcock	
Migrant	Unknown
Nesting	Low
Ducks	
Migrant	High
Nesting	Moderate
Geese	
Migrant	High
Nesting	Low

1/ New York State Department of Environmental Conservation survey data.
2/ Listing of nongame mammals, birds, reptiles, and amphibians are found in Appendix E.

of forest adjacent to the muck. Limited portions of this area are in an early successional stage highly suited for wildlife production. The wooded wetlands provide forest wildlife habitat limited by a seasonal high water table.

The cultivated upland habitat area contains scattered small woodlots and wetlands. This combination of cover and crop production highly favors open land wildlife. The band of forest adjacent to the muck and the wooded wetlands afford escape cover. Moderate to high population of open land wildlife are concentrated in the upland areas.

Species commonly associated with water are known as wetland wildlife (waterfowl, shorebirds, and furbearers). The density of these species is influenced by the amount and type of water body and vegetation, as well as their dispersion. Woodcock and migratory waterfowl pass through the area, but most nesting takes place within the adjacent management areas. A variety of aquatic amphibians and reptiles is common throughout the habitat (Appendix E, Listing of Reptiles and Amphibians).

Surface water resources provide very little public sport fishing. Table I, Physical Characteristics of Watershed Streams, provides a description of fishery habitat resources. Reach A of Oak Orchard Creek (Figure 10), does not contain a sport fishery. The stream throughout this reach is small with shallow depths. The gradient is low prohibiting development of pools and riffles. Bottom material is comprised of silt. Due to stream size and lack of shade water temperatures exceed the tolerance levels for cold water species. Cover capable of supporting warm water game fish is not found in this reach, however, several species of minnows may exist.

Reach B is a straight manmade channel through the muckland. Sediment deposition and channel maintenance through the cultivated muckland have produced a uniform bottom which does not afford cover for warm water game fish. Warm water game fish exist, however, in the wooded wetlands downstream from the cultivated muckland. This fishery is concentrated at Fisher Road where the highway bridge has developed a suitable cover condition. Principal species include bullheads, northern pike, sunfish, perch, and largemouth bass.

The tributaries of Oak Orchard Creek are small and shallow. Although cover capable of supporting warm water game fish does not exist in these reaches a variety of minnow species may be found.

Hunting opportunities in the watershed are few because much of the land where game species occur is posted and hunter-use is limited by permit. Most hunting occurs on the adjoining public wildlife management areas.

PLANT AND ANIMAL RESOURCES

Wildlife species have diverse requirements and occupy a vast variety of niches in the ecosystem. However, species may be generally grouped by main habitat into forest wildlife, open land or agricultural wildlife, and wetland wildlife. See Figure 10, Fish and Wildlife Habitat Resource Map. Table M shows estimated wildlife population densities, by habitat, in the watershed area.

Forest wildlife species are those which find both food and cover within the forest, although they may venture into open land to feed. Factors affecting the density of these species may include woodlot size, density of humans, and vegetative compositon, by type and successional stage. These factors, in conjunction with climatic conditions, determine species range. Habitat throughout the watershed is not highly suited for the production of forest wildlife. The small woodlots in the upland habitat area do not provide adequate cover for high densities. These areas also have soils poorly suited for the production of forage and cover. Low to moderate populations of forest wildlife exist, particularly in the band

TABLE M - ESTIMATED WILDLIFE POPULATIONS[1/]

Species[2/]	Density
Forest Wildlife	
Whitetail Deer	Moderate (3 per 100 acres)
Ruffed Grouse	Low (1 per 40 acres)
Gray Squirrels	Low (1 per 10-20 acres)
Open Land Wildlife	
Pheasant	High (1 per 5 acres)
Cottontail Rabbits	Moderate (1-2 per 10 acres)
Raccoon	High (1 per 5-10 acres)
Wetland Wildlife	
Muskrat	High (20 per acre)
Mink	High (Unknown)
Woodcock	
Migrant	Unknown
Nesting	Low
Ducks	
Migrant	High
Nesting	Moderate
Geese	
Migrant	High
Nesting	Low

1/ New York State Department of Environmental Conservation survey data.
2/ Listing of nongame mammals, birds, reptiles, and amphibians are found in Appendix E.

of forest adjacent to the muck. Limited portions of this area are in an early successional stage highly suited for wildlife production. The wooded wetlands provide forest wildlife habitat limited by a seasonal high water table.

The cultivated upland habitat area contains scattered small woodlots and wetlands. This combination of cover and crop production highly favors open land wildlife. The band of forest adjacent to the muck and the wooded wetlands afford escape cover. Moderate to high population of open land wildlife are concentrated in the upland areas.

Species commonly associated with water are known as wetland wildlife (waterfowl, shorebirds, and furbearers). The density of these species is influenced by the amount and type of water body and vegetation, as well as their dispersion. Woodcock and migratory waterfowl pass through the area, but most nesting takes place within the adjacent management areas. A variety of aquatic amphibians and reptiles is common throughout the habitat (Appendix E, Listing of Reptiles and Amphibians).

Surface water resources provide very little public sport fishing. Table I, Physical Characteristics of Watershed Streams, provides a description of fishery habitat resources. Reach A of Oak Orchard Creek (Figure 10), does not contain a sport fishery. The stream throughout this reach is small with shallow depths. The gradient is low prohibiting development of pools and riffles. Bottom material is comprised of silt. Due to stream size and lack of shade water temperatures exceed the tolerance levels for cold water species. Cover capable of supporting warm water game fish is not found in this reach, however, several species of minnows may exist.

Reach B is a straight manmade channel through the muckland. Sediment deposition and channel maintenance through the cultivated muckland have produced a uniform bottom which does not afford cover for warm water game fish. Warm water game fish exist, however, in the wooded wetlands downstream from the cultivated muckland. This fishery is concentrated at Fisher Road where the highway bridge has developed a suitable cover condition. Principal species include bullheads, northern pike, sunfish, perch, and largemouth bass.

The tributaries of Oak Orchard Creek are small and shallow. Although cover capable of supporting warm water game fish does not exist in these reaches a variety of minnow species may be found.

Hunting opportunities in the watershed are few because much of the land where game species occur is posted and hunter-use is limited by permit. Most hunting occurs on the adjoining public wildlife management areas.

Rare and endangered species of New York State are listed in the publication, "Rare and Endangered Fish and Wildlife of the United States." U. S. Bureau of Sport Fisheries and Wildlife, 1968 Edition (31). The bald eagle and American osprey, which are listed as endangered species, have been sighted during spring and fall migration in the watershed; however, no local nesting has been reported by the Iroquois National Wildlife Refuge.

The interaction of the food chain phenomena (energy loss at each transfer) and the size - metabolism relationship results in communities having a definite trophic (fr. trophe=nourishment) structure, which is often characteristic of a particular type of ecosystem (lake, forest, coral reef, pasture, etc.) (33). Primary producers (i.e. plankton, aquatic and terrestrial plants) are able to utilize solar energy and minerals and are thus able to provide energy for the consumers. Insects and herbivores (plant tissue consumers) such as muskrats, utilize plants for an energy source. Insectivores (insect consumers) such as birds, omnivores (plant tissue and animal tissue consumers) such as foxes, and carnivores (animal tissue consumers) such as hawks, thus utilize the primary producers as an energy source. Through decomposition, each trophic level serves as a mineral source for the primary producers. Figure 13 illustrates a food chain.

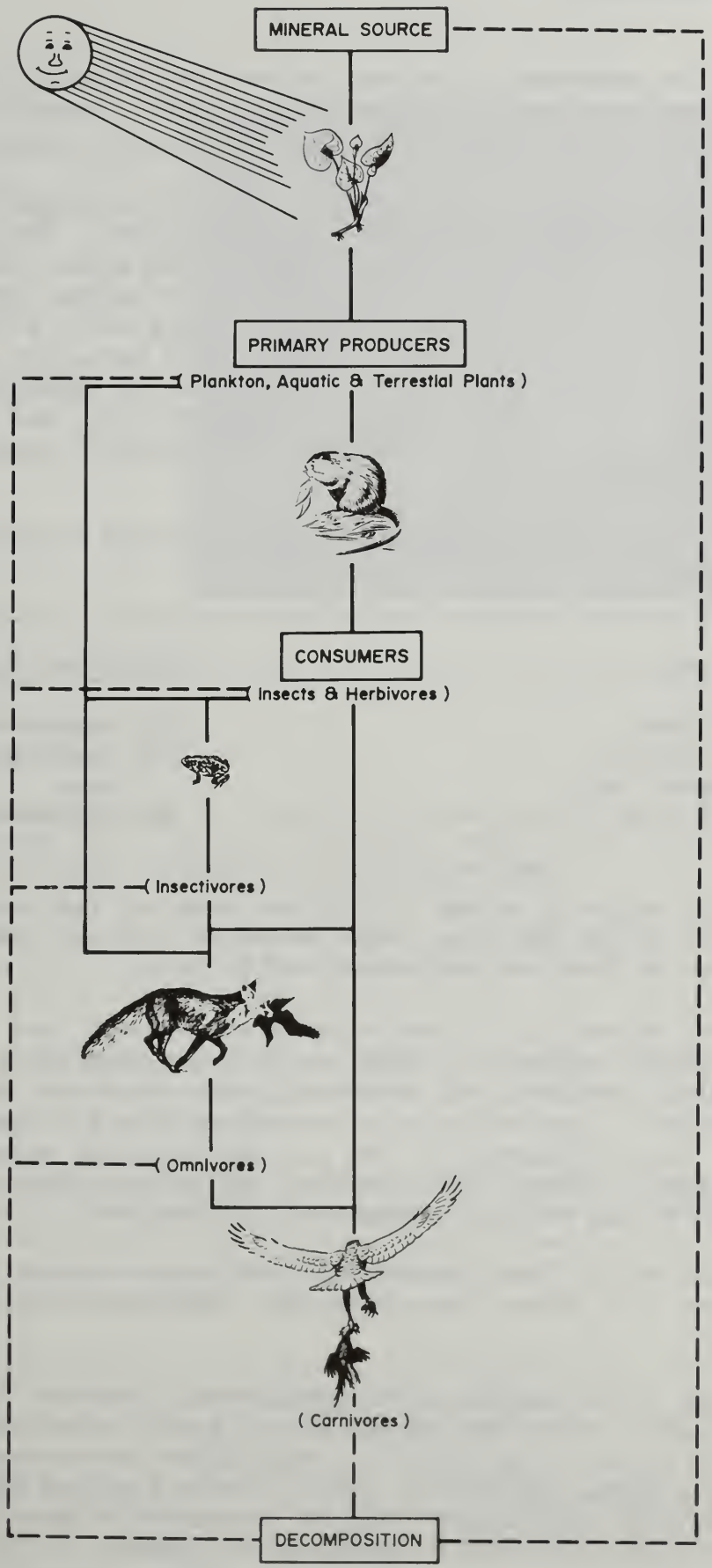


FIGURE 13 - FOOD CHAIN

ECONOMIC RESOURCES

Although the watershed is located between two metropolitan areas, projections indicate that it will retain its rural character during the foreseeable future. Most of the land is privately owned.

Major farm enterprises consist of dairying and cash grain production on the upland areas and truck farming on muckland. The watershed contains about 130 upland farms, averaging 200 acres, and about 100 muckland farms, averaging about 65 acres. Principal crops grown on the upland consist of corn for grain, yielding about 82 bushels per acre; corn for silage, yielding about 14 tons per acre; and alfalfa, yielding about 3 tons per acre. Principal crops grown on the muckland include onions, potatoes, lettuce, sweet corn, and minor acreages of beets, carrots, spinach, and grass sod. Table N shows flood-free yield for muckland crops.

TABLE N - MUCKLAND FLOOD-FREE CROP YIELDS

Crop	Yield per Acre
Onions	350 hundredweight
Potatoes	330 hundredweight
Sweet Corn	5 tons
Lettuce	375 hundredweight

The average value of upland is $350 per acre and the average value of muckland is $1,200 per acre. One-half acre lots with improvements in the village of Elba cost an average of $1,500.

Markets are accessible via existing farm-to-market road systems. Major markets for farm products are located in Rochester and Buffalo. Smaller towns surrounding the watershed, such as Albion, Batavia, and Medina, also provide markets for some of the products. State Highways 63, 98, and 262 cross the watershed. The New York State Thruway (Interstate 90) passes one mile south of the watershed; it has an interchange north of Batavia.

A main line of the Penn Central Railroad passes through Batavia and a secondary line passes through Medina. Sidings for freight are provided.

The economy of the watershed is agriculturally based. Agriculture on the muckland is intensive and produces a gross annual income, from truck crop sales, of $4,000,000. Truck farms provide more than 300 man-years of hired employment, part of which involves migrant workers. In 1972 Orleans and Genesee Counties produced 613 thousand hundredweight of onions (13) which represents 28 percent of the New York production and 2.2 percent of the United States production (28).

FIGURE 14

HARVESTED ONION CROP

The trend in landownership is toward consolidation of small farm units. This is particularly true for the muckland, where owners of large truck farms are buying or leasing the smaller farms.

The average gross income for upland farms was about $17,700 annually in 1969. About 83 percent of the upland farms are defined as family farms employing less than 1.5 man-years of hired labor annually (29).

Employment is provided by industries located near the watershed, such as the U. S. Gypsum Corporation and the Profac Canning Company. Industrial employment is increasing.

The population remained constant between 1960 and 1970. Numbers of farm families declined; however, increases in numbers of nonfarm families compensated for these losses. Unemployment rates of 6.4 percent in the watershed area and 5.2 percent in New York State were occurring as of December 1973 (17).

There is a strong market in and around the watershed area for hardwood sawtimber and some demand for veneer stock. Markets also exist for hardwood pulp and low grade logs for pallet and crate stock.

An estimated $0.71 out of every dollar of personal income is spent in retail trade in the region. An expenditure of $25,000 in the retail trade sector creates one man-year of employment (14).

RECREATIONAL RESOURCES

New York State's Northwest Recreational Planning and Development Region has an excellent recreational resource base. Five of its counties are located along Lake Erie and Lake Ontario, while 4 other counties contain parts of the Finger Lakes. The New York State Barge Canal system connects most of the inland urban areas. There are a number of special scenic resources such as Letchworth, Niagara Falls, Chimney Bluffs, and Zoar Valley, that are nationally significant. Considerable open space acreage, some of which is devoted to farming, exists throughout the region. There are major limits to these resources. The Great Lakes beaches are generally short and backed by sharply rising cliffs; a condition that limits swimming and development of harbors of refuge for boaters. Further, water quality has often been marginal in recent years; access to shorelines is restricted because of private ownership, and many quality natural open space resources are unprotected from urban encroachment. (Figure 15).

The northwest region is expected to grow from its current 2.5 million population to nearly 3 million by 1990, urbanizing many of the open spaces and agricultural areas now separating the Buffalo and Rochester metropolitan areas and other growing municipalities, such as Lockport, Tonawanda, Batavia, and Geneva.

Local recreation development consists of small county and town parks, local school yards, and the state and federal refuges.

FIGURE 15 NORTHWEST RECREATIONAL PLANNING AND DEVELOPMENT REGION (19)

ARCHEOLOGICAL AND HISTORICAL RESOURCES

Investigations conducted by Dr. Marian White (anthropologist), State University of New York at Buffalo, indicate that there are no historical or archeological materials or data in the watershed muckland. The National Register of Historic Places lists no properties in the watershed such as historic districts, sites, buildings, structures, or objects which are significant in American history, architecture, archeology, and culture. A New York State Museum and Science Service literature review revealed no archeological sites in the vicinity of planned structural measures. There are no unique scenic areas within the watershed. See Appendix G, Archeological Survey Within the Proposed Oak Orchard Watershed Project for further information.

SOIL, WATER AND PLANT MANAGEMENT STATUS

Expected changes in land use are minor. It is estimated that open land formerly cropped will be converted, over the next 25 years, to urban land and other land at annual rates of 30 acres and 75 acres respectively. Estimated future land use in the year 2000 is shown in Table O.

TABLE O - FUTURE LAND USE (2000)

Land Use	Acres	Percent
Cropland	21,700	54.4
Open land formerly cropped	700	1.8
Pastureland	1,870	4.7
Forest land	7,940	19.9
Urban land	2,280	5.7
Other land	5,370	13.5
TOTAL	39,860	100.0

There are about 9 acres of capability subclass VIe and 36 acres of VIIe cropland on which the factors of production (land, labor and capital) are being used inefficiently.

The Genesee County and Orleans County Soil and Water Conservation Districts are conducting intensive land treatment programs of land use planning and installation of treatment measures. Forty-five percent of the land area within the watershed is under district agreement. Of the 147 cooperators in the watershed, 109 have basic conservation plans, and approximately 25 percent of the cropland practices have been applied. About 30 percent of the pastureland is managed under regular pasture and hayland management systems.

Land "adequately treated" consists of 3,775 acres of cropland, 320 acres of pastureland, and 1,742 acres of urban and other land. Land "adequately treated" is defined as land used within its capability on which the conservation practices that are essential to its protection and planned improvement have been applied. None of the forest land within the watershed is considered to be adequately treated.

Approximately 18,560 acres of the watershed are "adequately protected." Land "adequately protected" is defined as land on which the soil, water, and related plant resources are adequately protected from deterioration, either naturally or by action of the land user.

Adequate forest fire protection is being provided by local volunteer fire departments and the New York State Department of Environmental Conservation in cooperation with the U.S. Forest Service through the Clarke-McNary Cooperative Forest Fire Control Program. There have been no forest fires in the watershed during the last five years. State-Federal Cooperative Forestry Programs presently providing assistance in the area include: Cooperative Forest Management (CFM), Cooperative Forestation (CM-4), and Cooperative Forest Insect and Disease Control.

PROJECTS OF OTHER AGENCIES

There are no known water resource development project proposals by county, state, or federal agencies that will affect, or be affected by, proposed project measures.

WATER AND RELATED LAND RESOURCE PROBLEMS

LAND TREATMENT

There are about nine acres of land capability subclass VIe and 36 acres of VIIe being used beyond their capability as cropland. There are also 11 acres of capability subclass VIIe being used as pasture-land that should have an adjustment in land use due to steepness of slopes. See Table F, Present Land Use.

An estimated 4,500 acres of cropland in the upland areas of the watershed have soil losses exceeding three tons per acre per year. About 2,500 acres of the muck cropland are subject to significant wind erosion. See "Erosion Damage" section.

Drainage is needed on approximately 490 acres of upland soils, and water management, to include drainage and water level control, is needed on 450 acres of muck. Lack of proper water level control on the muck allows excessive subsidence during dry periods and inhibits root development and release of plant nutrients during periods of high water level.

Land, labor, and capital are being employed inefficiently on forest land where management guidelines are lacking. Trees are being harvested indiscriminately, tree stands need improving, and erosion is occurring on skid trails and access roads.

FLOODWATER DAMAGE

Approximately 6,560 acres of muck cropland, including 6,310 acres of Elba and 250 acres of Manning muck, sustain floodwater damages due to out-of-bank flow. Flooding of the muck occurs annually.

Net income derived from crops on muck is being reduced by about $592,800 annually due to floodwater. These income losses result from increased production costs, decreased product quality, and decreased crop yields.

Indirect flood damages of about $59,300 are occurring annually. These damages include costs of interruptions of commerce and utilities and losses of employment resulting from floods. Total monetary damages of about $652,100 are occurring to vegetable crop production each year.

About 100 farms and about 350 people sustain direct damage; however, no direct floodwater damages to residences or businesses have been identified. See Figure 16, Typical Flooding of the Muckland.

FLOODED ONIONS (HARVESTED)

FLOODED POTATOES (UNHARVESTED)

FIGURE 16 - TYPICAL FLOODING OF THE MUCKLAND

EROSION AND SEDIMENT DAMAGE

Erosion, or the wearing away of land surface by running water, wind, ice, or other geological agents, is present throughout the watershed. Erosion occurs in the upland areas as a result of poor management, steep topography, cultural operations, and erosive soils.

Sheet erosion is the removal of a fairly uniform layer of soil from the land surface by runoff water (20). Sheet erosion rates by land use are shown in Table P.

TABLE P - UPLAND SHEET EROSION RATES BY LAND USE

Land Use	Tons/Acre/Year
Cropland	1.18-6.40
Open Land Formerly Cropped	0.03
Pastureland	0.31
Forest Land	0.04
Other Land 1/	0.22

1/ Includes roads, farmsteads,urban and built-up areas

Moderate roadbank and streambank erosion occurs in localized situations. It is estimated that 222 miles of roadbank is subject to erosion at an average annual rate of 2.5 tons per bank mile. Ninety-nine miles of streambank erosion occurs at an average annual rate of 58 tons per bank mile.

The largest measurable source of sediment is sheet erosion. It occurs at a rate of 6.4 tons/acre/year on approximately 4,500 acres of cropland in the upland area. The major factors involved in the high erosion rates are poor cropping sequences with a high amount of row crops and poor tillage practices. Average annual sediment discharge at the mouth of the watershed is approximately 9,800 tons per year. This is equivalent to a sediment concentration of 145 milligrams per liter. Sediment damages related to sediment discharges were not evaluated.

Wind erosion occurs on the muck where proper land treatment measures have not been applied to provide protection. Individual soil particles strike young plants and cut off tender stalks and leaves. Windblown particles deposited on the leeward side of fixed objects smother plants. Fertilizers and pesticides, attached to or absorbed by soil particles, are lost by wind erosion. Soil losses due to wind erosion are estimated at 1/2 inch annually on fields that are not adequately protected.

PLANT AND ANIMAL RESOURCE PROBLEMS

Absence of cover in the stream throughout the watershed restricts the development of a warm water sport fishery to localized areas. This has resulted from low stream gradients and channel modification. The smaller natural streams do not have adequate depth or size to produce a warm water fishery.

Present trends of agriculture toward maximum utilization and intensive cropping systems is potentially detrimental to the maintenance of high small game populations. The elimination of odd areas and hedgerows reduces escape and winter cover. Early mowing results in high nesting mortality. Modern machinery, highly efficient in crop removal, has decreased grain residues which often serve as winter food sources for wildlife.

Conifers which provide escape, roosting, and winter cover for a variety of wildlife are deficient. Woodlots large enough to establish a high density of associated wildlife are not present in the watershed. The woodlots are also restricted to the poor soils which limit plant growth.

Basic habitat need of wildlife, as defined by the Division of Fish and Wildlife (Department of Environmental Conservation), and recommendations for improving habitat by species are shown in Table Q.

ECONOMIC-SOCIAL PROBLEMS

Approximately 77 percent of the farms in Genesee and Orleans Counties reported gross agricultural sales of less than $20,000. Most of the farms are classified as family farms (29).

In the muck area, owners of small tracts rent their land to the 100 farm operations. Each farm operation creates 1-1/2 or more man-years of employment annually. When flooding of the muck occurs, owners and operators experience substantial losses, and hired labor is often forced to seek employment elsewhere. Part of the hired labor is provided by migrant workers.

A study conducted in 1969 indicated an unemployment rate of 7.1 percent for migrant workers and 1.1 percent for the general population of Genesee County. An April 1974 study indicated an unemployment rate of 5.0 percent for Genesee County. Additional data provided by the Genesee-Finger Lakes Regional Planning Board shows a median family income of about $3,750 for migrant workers versus $8,400 for the general population of the county. About 24.1 percent of migrant worker families live in substandard housing in contrast to 5.5 percent of the general population.

Flood damages on the muckland reduces agricultural labor requirements by about 20 man-years annually.

TABLE Q - NEEDS AND RECOMMENDATIONS
FOR IMPROVING WILDLIFE HABITAT

Species	Need	Recommendation
Waterfowl	Shallow marsh	Create large and small shallow water marsh areas
	Grassland nesting areas near marsh areas	Clear and seed part of marsh area borders to a grass-legume mixture
	Protection of nests from early season mowing destruction	Encourage mowing after broods hatch
Pheasants	Grassland nesting and feeding areas	Retain grassland areas by mowing and spraying
	Brushland wintering areas	Encourage maintenance of native brushlands by preventing encroachment of hardwood trees
	Cereal grains for winter food	Plant and leave standing corn and buckwheat, particularly adjacent to winter cover
	Protection of nests from early season mowing destruction	Encourage late season mowing
Cottontail Rabbits	Dense escape cover	Plant clumps, one acre blocks, or windbreaks of conifers adapted to site. Create brush piles
Deer	Maintenance of deer wintering area habitat	Release apple trees, maintain brushy areas, create slashings in suitable browse timber species and maintain grass-legume fields adjacent yard areas
Woodcock	Preservation of brushy swale areas	Maintain brushy areas
	Preservation of meadows adjacent to brushy swale areas	Maintain old meadows by mowing

RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

There are no known approved or proposed federal, state, or local land use plans which will conflict with the proposed project measures. The proposed project measures conform with the objectives of the Clean Air Act and the Federal Water Pollution Control Act Amendments of 1972.

ENVIRONMENTAL IMPACT

CONSERVATION LAND TREATMENT

The installation of vegetative and structural types of land treatment measures would effectively reduce runoff, conserve soil moisture, reduce flood damages by 8 percent, and reduce losses of topsoil. Erosion rates on about 4,500 acres of erosive upland cropland will be reduced from 6.4 tons per acre to less than 3 tons per acre. The alleviation of erosion on cropland will reduce losses of fertilizer and other agricultural chemicals, as well as crop losses, caused by erosion. Annual quantities of sediment delivered to the mouth of the watershed will be reduced from 9,800 to 7,200 tons. Sediment concentrations at the mouth will be reduced from 145 mg/l to 107 mg/l. Installation of windbreaks on the muck will reduce wind erosion and associated damages. The planting of 700 acres of trees will speed successional trends on open land formerly cropped to forest wildlife habitat. The 230 acres of cultural operations will provide an increase in both variety and abundance of ground cover which will increase carrying capacity for wildlife. Control of the water level in the muck, by the structures for water control, will slow down subsidence and its adverse effects on the drainage system; reduce wind erosion; and reduce the effects of a fluctuating water table on crop yields.

Land treatment measures would enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

STRUCTURAL MEASURES

The area benefited by the installation of the combined program of land treatment and structural measures is delineated on the project map, Appendix B. Installation of structural measures will reduce average annual floodwater damages to crops by 77 percent. Damages will be eliminated from storms up to the 10-year frequency events with some damages remaining from storms of greater magnitude. About 100 muckland farms and about 350 people will receive direct floodwater reduction benefits. Reductions in indirect flood damages will benefit the watershed area by reducing interruptions of utilities and commerce. Flood stages at Knowlesville Road for the 10-year frequency storm will be increased about 0.1 feet by installation of the project. Knowlesville Road is located at the lower end of the Oak Orchard Wildlife Management Area. See Figure 11. No measurable effect will occur on the existing resources.

The level of flood protection will be adequate for intensive agricultural production, but is not adequate for urban development. The production of major crops on the muckland, such as onions, potatoes, lettuce, and sweet corn will be continued.

The alleviation of muckland flooding will reduce annual applications of fertilizer by 90 tons and annual applications of herbicides by 12,000 pounds. The planned structural measures will reduce the discharge of nutrients and toxic agricultural wastes from the watershed. Through better flood control and agricultural practices, these potential pollutants will tend to remain associated with the land, to be reduced into nontoxic substances or be utilized by plants.

During the period of construction, there will be normal inconveniences of noise and dust pollution from construction equipment and the need for detours around construction areas. An increase in present streambank sediment rates of approximately eight percent occur as a result of runoff during construction. Post-construction sediment rates will be reduced approximately five percent of present rates after the establishment of vegetative cover.

About 90 miles of channel will be subject to modification, with construction generally following existing channel alignment. Perennial weeds on the banks, and cattails and other emergent aquatics in the channel, will be eliminated by channel work. This vegetation will be replaced by seedings of perennial grasses and legumes that will be maintained and will be usable as nesting cover for songbirds and waterfowl. Muskrat activity in the channel will be temporarily disturbed during construction, and operation and maintenance activities. About 675 acres of land will be committed to the channel system during project life. About 337 acres will be maintained in grasses and legumes, 166 acres will be used for the conveyance of water, and 172 acres will be used for travelways and maintenance roads.

Destruction of within channel vegetation during construction will cause displacement of herbivores or first level consumers (i.e. muskrats, woodchucks, rabbits, and birds). The reduction in numbers of herbivores will cause losses in numbers of carnivores or second level consumers (i.e.foxes, mink, birds of prey, and domestic dog and cats). The second level consumers will prey more heavily on the insectivores (i.e.fish, reptiles, amphibians,and birds) which are maintained by plankton production. As vegetation is restored, through revegetation of the channels, numbers of herbivores and subsequently numbers of carnivores will be restored.

Construction of structural measures will eliminate 10 acres of cropland, one acre of open land formerly cropped, and 28 acres of forest land. These areas produce an estimated $6,670 of annual net income.

Channel work will alter approximately 39 acres of wildlife habitat as listed in Table R. The Fish and Wildlife Division of the New York State Department of Environmental Conservation reports that no sport fishery exists within the channels to be modified.

TABLE R - HABITAT ALTERED BY CHANNEL MODIFICATION

Channel 1/	Woodland (Red Maple, Willow, Ash) (acres)	Brushy Cover (Ash, Saplings, Dogwood, Willow) (acres)	Cropland (acres)	Wildlife Species
SMW	-	1.0	-	Songbirds, rabbits
S	0.5	-	1.0	Songbirds, some browse for deer
Ditch #1	-	-	0.5	-
Ditch #2	-	-	2.0	-
Ditch #4	-	-	2.0	-
Ditch #5	-	-	0.5	-
Ditch #6	-	-	0.5	-
Ditch #15	-	-	0.1	-
Ditch #18	0.7	-	0.3	Songbirds, some browse for deer
Ditch #19	-	-	1.1	-
Ditch #20	-	-	0.7	-
Ditch #33	-	-	0.1	-
Ditch #34	0.5	-	-	Songbirds, some browse for deer
Ditch #35	-	-	0.3	-
Ditch #43	1.0	-	-	Songbirds, some browse for deer
Ditch #44	0.4	-	-	Songbirds, some browse for deer
Ditch #45	0.9	-	-	Songbirds, some browse for deer
Ditch #48	4.0	-	-	Songbirds, some browse for deer
Ditch #50	-	-	0.1	-
T	-	-	0.6	-
WMN	20.0	-	-	Songbirds, some deer and grouse
Hinsburg Rd.	-	-	0.2	-
TOTAL	28.0	1.0	10.0	

1/ Channels not listed will be reconstructed entirely within their present limits. Wildlife species within these channels, such as muskrats and aquatic birds, will be temporarily disturbed during construction.

ECONOMIC AND SOCIAL

The project will help to stabilize agricultural income by installation of structural measures. Muckland farm operators will be better able to manage their land, labor, and capital when flood damages and associated uncertainties are reduced.

Per capita income in the watershed will be increased about $95 as a result of increased agricultural income. Average net income of the 100 muckland farms will be increased about $5,000 annually. This will encourage their continued existence and will help to reduce the migration of rural people to urban areas. Increased income of the farm laborers and increases in the tax base will help reduce deficiencies in needed services.

Increased agricultural production will create about 20 man-years of additional employment annually. This increased employment will help alleviate the chronic unemployment and underemployment problems of the migrant farm laborers. Increased income for the farm laborers will help reduce the gap between the living standards of the farm labor families and the general population. Construction of structural measures will create about 90 man-years of employment. Operation and maintenance of structural measures will create about 1-1/2 man-years of employment annually.

FAVORABLE ENVIRONMENTAL IMPACTS

1. Agricultural flood damage from floods up to the magnitude of the 10-year frequency event will be eliminated on the 6,560 acres of cultivated muckland.

2. Direct flood prevention beneficiaries include about 350 persons and 100 farm enterprises.

3. Annual agricultural floodwater damages will be reduced by 85 percent.

4. Reductions in indirect flood damages, by 85 percent, will benefit the watershed area by reducing interruptions of utilities and commerce.

5. Annual erosion rates on about 4,500 acres of erosive upland cropland will be reduced from 6.4 tons per acre to less than 3.0 tons per acre.

6. Losses of fertilizer and other agricultural chemicals and losses of crop production, caused by erosion, will be reduced.

7. Annual quantities of sediment delivered to the mouth of the watershed will be reduced from 9,800 to 7,200 tons.

8. Sediment concentration at the mouth will be reduced from 145 mg/l to 107 mg/l.

9. Installation of windbreaks on the muck will reduce wind erosion and associated damages.

10. The planting of 700 acres of trees on open land formerly cropped will speed successional trends to forest land wildlife habitat.

11. Control of the water level in the muck, by the structures for water control, will slow down subsidence and its effects on the drainage system; reduce wind erosion; and reduce the effects of a fluctuating water table on crop yields.

12. Land treatment measures will enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

13. Major crops raised on the muckland such as onions, potatoes, lettuce, and sweet corn will continue to be raised.

14. The alleviation of muckland flooding will reduce annual applications of fertilizer by 90 tons and annual applications of herbicides by 12,000 pounds.

15. The discharge of nutrients and toxic agricultural wastes from the watershed will be reduced.

16. Through better water control and agricultural practices, pollutants will tend to remain associated with the land, to be reduced into nontoxic substances or be utilized by plants.

17. Seeding of 337 acres of channel banks to perennial grasses and legumes that will be usable as nesting cover by songbirds and waterfowl.

18. The project will help stabilize agricultural income.

19. Muckland farm operators will be better able to manage their land, labor, and capital when flood damages and associated uncertainties are reduced.

20. Per capita income in the watershed will increase about $95 as a result of increased agricultural income.

21. Average net income of the 100 muckland farms will be increased about $5,000 annually. This will encourage their continued existence, and help to alleviate the migration of rural people to urban areas.

22. Increased agricultural production will create about 20 man-years of additional employment annually.

23. Increased employment will help alleviate the chronic unemployment and underemployment problems of the migrant farm laborers.

24. Increased income for farm laborers will help reduce the gap between the living standard of the farm labor families and the general population.

25. Increased incomes of the farm laborers and an increase in the tax base will help alleviate deficiencies in needed services.

26. Construction of the structural measures will create about 90 man-years of employment.

27. Operation and maintenance of structural measures will create about 1 1/2 man-years of employment annually.

ADVERSE ENVIRONMENTAL EFFECTS

1. Construction of structural measures will eliminate wildlife habitat associated with 10 acres of cropland, one acre of open land formerly cropped, and 28 acres of forest land. These areas produce an estimated $6,670 of annual net income.

2. During the period of construction, there will be the normal inconveniences of noise and dust pollution from construction equipment and the need for detours around construction areas.

3. A short term increase in sediment downstream may be observed as a result of runoff during construction.

4. The elimination of perennial weeds on the banks, and cattails and other emergent aquatics in the channel by construction, will alter this type of habitat for aquatic and terrestrial species.

5. Muskrat activity in the channel will be temporarily disturbed during construction.

6. Planting of trees on open land formerly cropped will speed the rate of plant succession to forest wildlife habitat, with a resulting loss of open land wildlife habitat.

7. Flood stages at Knowlesville Road for the 10-year frequency storm will be increased about 0.I feet by installation of the project.

ALTERNATIVES

Alternatives to the project can be divided into four categories; land treatment, nonstructural measures, structural measures, and no project. Many combinations of these categories are possible, including some which are not realistic. During the evaluation of alternatives, those which proved to be unworkable, or impossible, were not explored further.

Land Treatment

This alternative would provide accelerated technical assistance to review and make needed revisions of conservation and woodland plans; to maintain existing cover, which is adequate; install essential land treatment measures; and to plan and apply land treatment measures applicable to land areas which require treatment.

The land treatment phase would apply to each acre in the watershed. Conservation measures would be applied on cropland, pastureland, forest land, and other land, as described under the "Planned Project" section.

The cost of land treatment would be about $1,800,000. This alternative would improve the hydrologic condition of the watershed and would reduce flood damages by about 8 percent.

The installation of vegetative and structural types of land treatment measures would effectively reduce runoff, conserve soil moisture, and prevent excessive losses of topsoil. The amount of sediment leaving the watershed would be reduced by 2,600 tons annually.

Land treatment measures would enable landowners to better implement sound land management plans and increase efficiencies of production, increase wildlife habitat, and improve water quality.

This alternative alone would not meet the selected objectives of the Sponsors but would preclude the following impacts of the selected alternative:

1. Construction of structural measures will eliminate wildlife habitat associated with 10 acres of cropland, one acre of open land formerly cropped, and 28 acres of forest land which produce an estimated $6,670 of annual net income.

2. During the period of construction, there will be the normal inconveniences of noise and dust pollution from construction equipment and the need for detours around construction areas.

3. A short term increase in sediment downstream may be observed as a result of runoff during construction.

4. The elimination of perennial weeds on the banks, and cattails and other emergent aquatics in the channel by construction, will alter this type of habitat for aquatic and terrestrial species.

5. Muskrat activity in the channel will be temporarily disturbed during construction.

6. Planting of trees on open land formerly cropped will speed rate of plant succession to forest wildlife habitat, with resultant loss of open land wildlife habitat.

Land Treatment, Pumping Plant, Floodwater Retarding Structures, Structures for Water Control, and Channel Work

This alternative consists of accelerated land treatment; a 700 cubic feet per second pumping plant located at the western edge of the muck; three floodwater retarding structures, with no permanent water stored, located along the southern edge of the muckland; about 100 structures for water control; and about 18.5 miles of channel work, consisting of deepening and widening the existing main channels. This alternative has an estimated cost of $7,200,000 and would cause the following impacts.

1. Eighty-five percent reduction of floodwater damage (control flooding up to the 10 year event) on 6,560 acres of muckland.

2. Retention of the muckland in agricultural production.

3. Income would be increased to about 100 farm families.

4. Activities stemming from the project would create about 21-1/2 man-years of employment annually through operation and maintenance of project measures and increased agricultural production.

5. Wildlife habitat along the channels would change from weeds and brush to grasses and legumes.

6. About 1,850 feet of natural channels would be eliminated by the construction of the floodwater retarding structures.

7. About 42 acres of land; consisting of 9 acres of forest land, 11 acres of pasture and 22 acres of cropland, would be changed to maintained grasses and legumes, as a result of the construction of the floodwater retarding structures.

8. About 259 acres of land consisting of 28 acres of forest land, 73 acres of pastureland, 107 acres of cropland, and 51 acres of Type VII Wetland, would be subject to temporary flooding in the floodwater retarding pools.

9. Limited short term increases in sediment rates and in air pollution would occur during construction of structural measures.

10. Short term loss of wildlife habitat would occur during construction.

11. Displacement of about 12 persons would occur.

12. Construction activities would create 95 man-years of employment.

The land treatment would be the same as that discussed under "Land Treatment." The same costs and effects would be applicable. This alternative would meet the sponsors objectives. However, the environmental consideration regarding displacements would not be met. The adoption of this alternative alone would not preclude any impacts of the selected alternative.

Land Treatment, Floodwater Retarding Structures, Structures for Water Control, and Channel Work

This alternative consists of accelerated land treatment; 3 floodwater retarding structures, with no permanent water stored, located along the southern edge of the muckland; about 100 structures for water control; and about 86.7 miles of channel work consisting of deepening, enlarging, and diking existing channels in the muckland.

This alternative has an estimated cost of $6,500,000 and would cause the following impacts:

1. Eighty-five percent reduction of floodwater damage (control flooding up to the 10 year event) on 6,560 acres of muckland.

2. Retention of the muckland in agricultural production.

3. Income would be increased to about 100 farm families.

4. Activities stemming from the project would create about 21-1/2 man-years of employment annually.

5. Wildlife habitat along the channels would change from weeds and brush to grasses and legumes.

6. About 1850 feet of natural channels would be eliminated by the construction of the floodwater retarding structures.

7. About 42 acres of land consisting of 9 acres of forest land, 11 acres of pastureland, and 22 acres of cropland, would be changed to maintained grasses and legumes, as a result of the construction of the floodwater retarding structures.

8. About 259 acres of land; consisting of 28 acres of forest land, 73 acres of pastureland, 107 acres of cropland, and 51 acres of Type VII Wetlands, would be subject to temporary flooding in the floodwater retarding pools.

9. Limited short term increases in sediment rates and in air pollution would occur during construction of structural measures.

10. Short term loss of wildlife habitat during construction.

11. Displacement of about 12 persons.

12. Construction activities would create about 62 man-years of employment.

The land treatment would be the same as that discussed under "Land Treatment." The same costs and effects would be applicable. This alternative would meet the Sponsors' objectives; however, the environmental considerations regarding displacements would not be met. The adoption of this alternative alone would not preclude any impacts of the selected alternative.

No Project

The No Project alternative would not make any changes in the existing environment. The watershed would essentially remain as outlined in the "Environmental Setting" section of this report. It would still be plagued with the problems which led to the initiation of this project; however, the soil conservation districts' ongoing programs would continue. Both the adverse and favorable effects of the selected project measures would be eliminated. Flood damage reduction and secondary benefits would be foregone. Net average annual monetary benefits foregone would total $296,300.

SHORT TERM VS. LONG TERM USE OF RESOURCES

The most obvious trend in land use change is that of open land formerly cropped being converted to other land uses. The following table summarizes the present and expected future land use under with and without project conditions.

TABLE S - PRESENT AND FUTURE LAND USE (2000)

Land Use	Present Use		Future Use	
	(Acres)	(Percent)	(Acres)	(Percent)
Cropland Upland	13,638	34.2	15,140	37.9
Muck	6,560	16.5	6,560	16.5
Open Land Formerly Cropped	5,186	13.0	700	1.8
Pastureland	1,620	4.1	1,870	4.7
Forest Land	7,751	19.4	7,940	19.9
Urban Land	1,589	4.0	2,280	5.7
Other Land	3,516	8.8	5,370	13.5
TOTAL	39,860	100.0	39,860	100.0

Structural measure installation will restrict options for future use on land to be occupied by the channels, or about 1.7 percent of the watershed. On the remaining 98.3 percent, opportunities for productive use will be maintained or enhanced.

This project is designed to meet the immediate need for flood prevention and to continue to satisfy the need, with adequate maintenance, for at least 50 years. The plan is compatible with the long term uses of the natural resources, and will mesh readily with known water and related land resource plans of a wider scope.

The work plan was reviewed by appropriate state and federal agencies and is compatible with other water resource projects in the region. The Oak Orchard Creek Watershed is located in the Ontario Lake Plains Basin. While the watershed was not studied under the Type IV Comprehensive Study of the Ontario Lake Plains Basin, the proposed project will not contravene the objectives and purposes of this study. There are no other P.L. 566 watershed projects in the Basin.

Accumulative effect, outside the watershed, is the reduction of sediment delivered to the mouth of the watershed by 2,600 tons annually.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The structural measures will occupy 675 acres of land. The existing facilities occupy 636 acres, and an additional 39 acres will be committed to the structural measures through installation of the selected plan.

Other commitment of resources includes labor, materials, and energy required for construction of the project.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

GENERAL

The Oak Orchard Creek Watershed Sponsors and the Soil Conservation Service encouraged the participation of interested public agencies and the general public in the planning process by keeping them informed of planning progress and providing them with forums to discuss their respective concerns. The diverse interests expressed by the public agencies and private citizens were considered in the formulation of the project.

A news release describing a proposal for applying for P.L. 566 watershed planning assistance received wide distribution by press and radio in April 1963. The public and agency representatives were invited to participate in the formulation of the project. About forty consultation and coordination meetings, involving Sponsors, interested individuals, and public agencies, were held during project formulation.

The Genesee County Legislature, the Orleans County Board of Supervisors, the Orleans County Soil and Water Conservation District, and the Genesee County Soil and Water Conservation District filed an application for assistance under P.L. 566 in November 1963. The Division of Water Resources, New York State Conservation Department, approved the application in January 1964. A request for planning authority under P.L. 566 was submitted to the Soil Conservation Service's Washington Office in July 1965. The SCS Administrator authorized planning in August 1965.

A number of coordination meetings, involving representatives of the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, the Soil Conservation Service, and the Sponsoring Local Organization, were held during project formulation. Of particular concern were possible environmental impacts of project measures on the state and national wildlife refuges located immediately downstream from the watershed. An early decision was made to formulate project measures which would not result in consumptive use of water.

The Sponsoring Local Organization, in response to concerns expressed by private citizens, adopted a policy to not accept a project involving the displacement of people, businesses, or farms.

Several alternatives were evaluated during planning in order to determine a feasible plan acceptable to the Sponsors. Representatives of the Soil Conservation Service presented physical and economic data relative to these alternatives to the Sponsors as they were developed.

The Sponsors secured landrights for geologic investigations of structure sites and raised $10,000 for these investigations. The muckland farmers assessed themselves about $3,000 for publicity, liaison work, and informational meetings regarding the proposed project.

The Sponsors reduced the size of the proposed watershed project area from 82,937, as indicated in the original application for P.L. 566 assistance, to 39,860 acres in April 1974.

The planning of this watershed has been coordinated with the New York State Office of Parks and Recreation regarding historical and archeological investigations. The New York State Museum and Science Service recommended that an investigation of specific areas to be disturbed be made by an archeologist prior to completion of the work plan. This survey was completed in July 1974. Personnel of the Bureau of Sport Fisheries and Wildlife, U. S. Department of the Interior, and the New York State Department of Environmental Conservation made a reconnaissance of the project area with Soil Conservation Service personnel, to coordinate the fish and wildlife aspects of the project. The Environmental Protection Agency has provided an assessment of water quality, and advised Soil Conservation Service personnel during project formulation.

A Type IV River Basin Study coordinated by the New York State Department of Environmental Conservation has been authorized and is underway in the Ontario Lake Plains River Basin, which includes Oak Orchard Creek Watershed.

The following agencies were asked to comment on the draft statement:

Department of the Army
Department of Commerce
Department of Health, Education, and Welfare, Region II
Department of the Interior
Department of Transportation
Office of Equal Opportunity - USDA
Environmental Protection Agency
Advisory Council on Historic Preservation
Federal Power Commission
New York State Department of Environmental Conservation
(designated State agency)
New York State Office of Planning Services
New York State Planning and Development Clearinghouse
(State Clearinghouse)
Genesee-Finger Lakes Regional Planning Board (Area-wide Clearinghouse)
National Audubon Society
National Resource Defense Council
League of Women Voters
Orleans Community Action Committee, Inc.
Genesee County Department of Planning
Genesee West Audubon Society
National Wildlife Federation

DISCUSSIONS AND DISPOSITIONS OF EACH COMMENT ON DRAFT STATEMENT

No response was received during the review of the draft Environmental Impact Statement from the following agencies:

Department of the Army
Department of Commerce
Office of Equal Opportunity - USDA
Federal Power Commission
New York State Office of Planning Services
National Audubon Society
National Resource Defense Council
League of Women Voters
New York State Planning and Development Clearinghouse
(State Clearinghouse)

Comments were received from the following:

Department of Transportation
Department of Health, Education, and Welfare 1/
State of New York Department of Environmental Conservation
(designated State agency)
Advisory Council on Historic Preservation
Orleans Community Action Committee, Inc.
United States Environmental Protection Agency
Genesee/Finger Lakes Regional Planning Board (Area Clearinghouse)
Genesee County Department of Planning
Genesee West Audubon Society
United States Department of the Interior
National Wildlife Federation

Each issue, problem, or objection, is summarized and a response given on the following pages. Comments are serially numbered where agencies have supplied multiple comments. The original letters of comment appear in Appendix C.

1/ Comments from the Department of Environmental Conservation includes comments from the State Clearinghouse.

DEPARTMENT OF TRANSPORTATION

(1) Comment: The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objections to this project.

Response: Noted.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE REGION II

(1) Comment: On the basis of our review of the above (Draft EIS #037-09-74, Oak Orchard Creek Watershed), we have determined that the impacts in those areas of concern to this Department have been adequately addressed. We have no adverse comment in relation to the implementation of this project.

Response: Noted.

STATE OF NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION

(1) Comment: We have reviewed the above noted document (Draft EIS, Oak Orchard Creek Watershed) and believe that it adequately discusses the environmental impacts that may result from implementation of the proposed project. Our recommendations which were incorporated into the watershed work plan should minimize adverse effects resulting from the project, particularly on adjacent wildlife refuges.

Response: Noted.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

(1) Comment: The Advisory Council on Historic Preservation has determined that your draft environmental statement appears procedurally adequate.

Response: Noted.

(2) Comment: A copy of the comments received from the State Historic Preservation Office should be included in the environmental statement.

Response: A letter was received on March 19, 1975 from the New York State Parks and Recreation, Division for Historic Preservation which identified three historic places near the southern side of the project in Genesee County. Also included was a brief report on the Oak Orchard Creek Marsh, near Alabama, which

has been designated a Natural Landmark by the Department of the Interior. Since the three historic places and the Oak Orchard Creek Marsh are outside the watershed project area and since there will be no affect on these areas by the construction of the proposed project or any affect induced by the project, it was determined not to include this data in the final EIS. A recommendation was also made by the National Register Supervisor that an archeological survey be conducted in the watershed prior to construction. A survey was completed in June 1974 under the direction of Dr. Marian White. The report of this survey is included as an appendix to the Final Environmental Impact Statement.

ORLEANS COMMUNITY ACTION COMMITTEE, INC.

(1) Comment: Enclosed you will find a copy of a report done for us by Dr. F. R. Fosberg, Curator of Botany at the Smithsonian Institution, concerning the gorge area of Oak Orchard Creek. It certainly should be included in the Final Environmental Statement you will be issuing for the Oak Orchard Creek Watershed project.

Response: Dr. Fosberg's report is included in the final EIS as an attachment to your original letter. (Appendix C) However, this report covers the lower five miles of Oak Orchard Creek, from the hydro-electric dam to Lake Ontario. This area will not be affected by the proposed project action.

(2) Comment: It is our understanding that the rough draft of this statement has been published and is available for study and consideration. Could you please send us a copy so that we may make it available to interested persons, including our Board of Supervisors, in this area?

Response: All available copies of the original draft have been distributed. A copy of the Final Environmental Impact Statement will be sent to you when completed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

(1) Comment: A stream survey of Oak Orchard Creek was conducted in accordance with a signed agreement between EPA Region II and the Soil Conservation Service (SCS). The main purpose of the survey was to supplement existing water quality data and to assist SCS in the preparation of the EIS for the Oak Orchard Creek Watershed. Information from this survey, however, has not been incorporated into the draft EIS. The final EIS should incorporate the results of this survey.

Response: The EPA Region II Oak Orchard Creek survey report has been incorporated into the EIS as Appendix F.

(2) Comment: The heavy metal analyses of the survey indicate that significant amounts of zinc and lead are concentrated in the stream sediments. Although the results of biological investigations indicate that the macro-invertebrate population of these sediments are not greatly affected by these toxicants, the heavy metal analyses "do stress a need for caution during construction to minimize disturbance of these bottom sediments." The effects of the disturbance of these sediments on wildlife should be discussed in the final EIS.

Response: Significant concentrations of zinc and lead are present in the bottom sediment (see enclosure (2), Appendix F). A fishery, vulnerable to concentration of lead and zinc in solution, exists downstream from the proposed project.

The gradient of the channel, accompanied by extremely low velocities, results in a very inefficient sediment transport system. Sediment disturbed at one point in the channel will settle out a short distance downstream. Therefore, disturbance of the bottom sediment, throughout most of the channel work, will not effect the downstream fishery. See Planned Project Section for description of means of controlling sediment during project construction.(page II-9)

(3) Comment: The EIS reports that the channel work would take place on only one side of the drainage ditches so as not to totally disrupt the wildlife habitat which exists there. However, beyond saying that cattails and other emergent aquatic vegetation grow and that muskrat inhabit the area, little is said about the existing wildlife. A complete description of the ecosystems in the project area should be included in the final EIS.

Response: A diagram illustrating the ecosystem is included in the EIS "Environmental Setting" section, and a statement concerning impacts on the ecosystem has been added to the EIS "Environmental Impact" section.(page II-46)

(4) Comment: The statement says that most of the proposed channel work will follow the existing ditch alignments. Where will the new alignments around the muck area be located and what will be done with the abandoned ditches?

Response: The EIS states that construction of the mains and floodways will be in the existing manmade ditches and will consist of enlargement of the flow area. (page II-7) Construction of the floodwater diversions will generally be in existing ditches. Any new alignment is considered to be minor. The function of the diversions is to carry intermittent flow from the upland area surrounding the muck to the floodways and mains. There will be no "cutoff" bodies of water, i.e., oxbows, as a result of this construction. There is no plan to disturb abandoned ditches except where erosion problems may be occurring. Land treatment measures will be applied where needed to prevent progressive gully erosion upstream, sometimes known as "head cutting".

(5) Comment: Originally, the project was to encompass 82,937 acres of the watershed as opposed to the present 39,860 acres. The final EIS should discuss the reason for expanding the scope of the project.

Response: In April 1974, the Sponsors reduced the size of Oak Orchard Watershed from 82,937 acres to 39,860 acres. The 39,860 acres includes the project area and all drainage above the project area; whereas, the original application covered areas located west of the project area. Environmental impacts downstream from the project area were evaluated despite the acreage change.

(6) Comment: Thank you for the opportunity to review this EIS. All additional information requested should be included in the final EIS. Three copies of the final EIS are requested for subsequent review.

Response: The additional information has been included in the final EIS as requested. Three copies of the final EIS will be furnished to your office as requested.

GENESEE/FINGER LAKES REGIONAL PLANNING BOARD

(1) Comment: The environmental impact on the three public wildlife management areas - Oak Orchard, Tonawanda and Iroquois - are not adequately addressed. The report only mentions that "early decision was made to formulate project measures which would not result in consumption use of water" and acknowledges concern on the part of residents. The impact on these areas particularly on wildlife and water levels must be included.

Response: Flood stages at Knowlesville Road for the 10-year frequency storm will be increased about 0.1 feet by installation of the planned project. This will not have any measurable effect on existing or planned functions of the three management areas. (page II-46)

(2) Comment: While the project is basically designed to improve economic conditions in the area, there may be a recreation potential which should be considered.

Response: Recreation resources do exist in the region and the watershed as pointed out in the Environmental Setting. The project, as formulated, provides rather limited recreation potential; however, the plan could be supplemented at some future date to incorporate recreational development features.

(3) Comment: Will the benefits to agriculture result in the increased use of fertilizer and herbicides? The runoff from fertilizer and herbicides could affect water quality in both the project area and downstream.

Response: The project should result in reduced applications of fertilizer and herbicides. Flooding results in additional applications of fertilizer. (page II-47)

(4) Comment: The list of review agencies does not include the Great Lakes Basin Commission, it is suggested that they be included in the future.

Response: The Great Lakes Basin Commission will be provided with a copy of the final EIS. The noting of the oversight is appreciated.

(5) Comment: With regard to the Preliminary Regional Development Plan (December 1973) the project while not specifically mentioned, is consistent with the plan. The Regional Plan shows this area as unique agriculture. Route 98 is an intraregional rural link on the plan. A potential recreation area is indicated in the general area near the Orleans/Genesee County Line.

Response: The Northwest Recreational Planning and Development Region Map (Figure 15) was derived from the New York State Parks and Recreation Commission's Statewide Comprehensive Recreation Plan, Sept. 72. We appreciate receiving any pertinent information on potential recreation areas in the watershed.

(6) Comment: The Regional Planning Board strongly endorses the project based on the expected economic benefits to accrue and the handling of significant impacts within the project area. We appreciate the opportunity to comment upon the statement and look forward to receiving the Final Environmental Impact Statement.

Response: Noted.

GENESEE COUNTY DEPARTMENT OF PLANNING

(1) Comment: The impact statement makes only casual mention of the possible downstream effects of this project, particularly the effects on water levels and, consequently, wildlife in the Oak Orchard, Iroquois, and Tonawanda wildlife refuge. The report acknowledges concern on the part of the state and local residents as to the downstream effects of this project, yet the report (particularly the impact statement) does not address downstream effects nor do these effects enter into the cost-benefit calculations.

Response: See Response to Genesee/Finger Lakes Regional Planning Board comment number 1. If downstream economic impacts (induced benefits or costs) can be identified, the impacts will be reflected in the benefit/cost calculations.

(2) Comment: The report notes that migrant families will benefit from the increased incomes to the muck farmer through some increases in wages, family income, etc. This seems to be a significant social justification for the project. Based on prevailing wage rates, landowner practices, and owner-migrant relationships in the area, the sponsor should attempt to quantify this benefit. Essentially, there should be some calculated "guess" as to the amount of benefit the migrant worker will receive from this project, and how far will it go in reducing the noted "gap between the living standards of the farm labor families and the general population".

Response: An estimated five of the 20 man-years of additional annual employment to be created by the project will involve migrant labor. Potential increases in per capita income of the migrants were not estimated.

(3) Comment: The statement is generally complete, though at times sketchy in detail. This office feels the primary considerations of importance in reviewing this project are as follows:

a. The effects of the project on unique wetland areas downstream. These are lands held by the public for the protection of wildlife and the enjoyment of the public and are thus a public trust.

b. The number of groups in the community that can be identified as receiving a positive benefit from this project. This benefit may be quantifiable, as this project is being undertaken to provide economic benefits, or nonquantifiable though in this case these are likely to be less significant.

c. The effects on the environment within the immediate project area.

Response: a. The SCS shares your concern in preserving the unique wetlands downstream from the project area. There will be no measurable impacts to the wetland area from construction of the proposed project.

b. The economic and social impacts from a project such as Oak Orchard are significant. It is difficult to identify every group or individual who may be a recipient of benefits from the project, however, several are included in the "Environmental Impact" section, "Economic and Social" such as: farm owners and operators, farm laborers, construction workers, farm related businesses, and community related functions supported by the tax structure.

c. We agree the primary consideration of importance is the affect on the environment within the immediate project area. For this reason our major effort in assessing the environment and evaluating the effects was directed to this area.

GENESEE WEST AUDUBON SOCIETY

I. Environmental Problems

1. Comment: How much of an increase in sediment will this project initially effect if installed? Will this increase in sediment be incurred throughout the entire seven year installation period?

Detriment to the water quality of the area and to the mouth of the watershed, specifically the eastern edge of Oak Orchard Game Management Area, due to increased sediment deposits, would result if great increments of sediment were produced over such a long period of time.

Response: The increase in sediment from the installation of the project will result primarily from the excavation of the channels. An increase in the present sediment rate of approximately eight percent will occur during the four year channel construction period. The increase will produce more of a visual impact rather than a depositional problem. Colloidal materials carried in solution and suspension will discolor the water during construction activities, but will not settle out to any great degree to form large sediment deposits. All sediment control measures will be in effect during construction. Coarse sediment disturbed by excavation will deposit within the construction area where it can easily be removed. Any sediment increase will occur only during construction and shortly thereafter until vegetative cover is reestablished. Post-construction sediment rates will be reduced approximately five percent of present rates after the establishment of vegetative cover. Design velocities are within nonscour limits so there will not be any increase in channel bank erosion or bed scour. See Response to Environmental Protection Agency's comment No. 2 for additional information.

2. Comment: Channel work, as proposed, will further expose mineral soil, thus increasing the amount of leaching from the bed and sides of channels.

Response: It is acknowledged that erosion rates (and resultant rates of sedimentation) will increase temporarily following project installation and until the channels are again stabilized; however, it is doubtful that leaching rates will increase.

3. Comment: Roadbanks, dikes, and spoil areas should in all cases be covered with muck or muck soil to facilitate rapid growth of vegetation in order to minimize soil erosion and leaching.

Conflicting information regarding this matter occurs in the statement: in one section it is stated that such covering will only be done where muck is "available" (5), and elsewhere it is implied that muck will be applied to all the above structures (8, et passim).

Response: Soil containing a high percentage of organic material that is excavated from the channel will be spread on roadbanks, dikes, and spoil areas to facilitate rapid growth of vegetation in order to minimize erosion.

4. Comment: Strict provisions, and not merely "guidelines" (7) should be made in all cases to reduce pollution and erosion at the construction sites.

As alluded to above, all exposed areas should be protected from wind and water in all cases.

Response: Guidelines are used to allow a degree of flexibility to general contract provisions. All exposed areas, with the exception of cropland, will be protected from wind and water during construction.

5. Comment: Will reseeding or restocking with cuttings or shrubs be carried out using seeds and/or plants of different genetic types? If not, the resultant monoculture due to its lack of genetic diversity and, hence, adaptability potential, will be strongly susceptible to disease, etc.

Response: All seedings or plantings will consist mainly of grass-legume mixtures. Any shrub plantings will consist of various plants selected for the specific site and purpose they are to serve.

6. Comment: What parameters will be employed to time maintenance activities so that minimal damage will be done to wildlife (8)?

Response: Through consultation with the wildlife biologist a plan of channel maintenance will be developed that will minimize the effects on the identified wildlife species. Methods such as selective or timely mowing will be employed to provide the greatest diversity of habitats for adaptable species in the area. Channel cleanout, such as sediment and debris, has historically occurred during the non-growing season which will provide minimal damage to wildlife.

7. Comment: Excavation of material from just one side of the stream to be channelized will not preclude total destruction of wildlife habitat in most cases, as is implied by the draft statement (7). Such a quantitative view of wildlife habitat as that implicit in the statement reflects naivete and a lack of knowledge of fundamental ecology.

Wildlife habitat must be grasped and understood in more qualitative rather than quantitative terms. While excavation of one streambank may not directly affect the opposite bank, it is patently foolish to suggest that this action will not indirectly jeopardize and destroy wildlife habitat on this bank.

Response: See Response to Environmental Protection Agency Comment No. 3.

8. Comment: During the annual flood periods, approximately how rapid will water be flowing through all three types of channels? What are the present rates of water flow in drainage ditches and Oak Orchard Creek during these periods?

It seems that the project, as proposed, merely displaces the problem of soil erosion from the 4,500 acres of upland crop area to the banks and sides of channel or laterals.

Response: Stream flow velocities in the design channels range from 3.5 feet per second to as low as 0.02 feet per second. All channel sections have been checked to ensure a stable channel condition with design flows. Present rates of water flow are slightly slower than the design flow. Factors causing slower flow are shallow depths; obstructions in the channel such as trees, weeds, and debris; and stream meander or sloughed sides which cause the flow to be diverted from side to side.

Erosion rates on the upland will be reduced as the result of the planned land treatment program. The channel is designed to be as stable as pre-project conditions. The banks and sides of the channels and dikes will be covered with muck soil, where available, to ensure rapid establishment of vegetation to minimize erosion. Measures such as sediment basins and temporary vegetation and mulching will be provided to protect exposed areas until permanent vegetation is established.

Under the operation and maintenance plan an establishment period of three years is provided for all structural works of improvement and associated vegetative cover. The Sponsors and the SCS will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. After three years an inspection will be made annually by the Sponsors with a written report sent to the service.

9. Comment: To what extent will the ground water levels in the watershed be reduced by this project? How will the water tables in other areas of the Oak Orchard Creek drainage basin be affected?

Such reductions and their impacts must be carefully assessed by the sponsors of this project.

Response: The ground water levels in this watershed will not be reduced by this project, but rather may actually be improved. Land treatment measures installed in the upland areas will reduce runoff and increase infiltration, thereby improving ground water recharge. Land treatment measures and water level control structures installed on the muckland will keep ground water levels within a constant range rather than the wide fluctuations that normally occur in ground water levels between snowmelt in early spring to the dry periods in July and August.

10. Comment: The project as proposed will invariably result in the total destruction of the warm water fishery in Oak Orchard Creek near Fisher Road. The existence of this sport fishery is revealed in Table I(22).

The impact which this project will have upon this fishery is not recognized or assessed. The text of the Environmental Statement states explicitly that no sport fisheries exist within channels to be modified, yet the fishery is approximately 1,500 feet from where the proposed channelization of Oak Orchard Creek ends (Appendix B). Turbidity and other factors engendered by this project will in all probability destroy this fishery.

The omission of such a grave environmental impact is a most serious flaw of the draft statement.

Response: See Response to Environmental Protection Agency Comment No. 2.

11. Comment: What will be the approximate oxygen content of the water as a result of this project?

It seems that a definite reduction of dissolved oxygen would be effected by this project due to the removal of natural "aerators" such as rocks and other obstacles, which generate rapids and riffles (9, et passim). Such a reduction would have deleterious impact upon fish and other aquatic organisms.

The elimination of this natural aeration system will also jeopardize the purity and quality of the water in the area.

Response: The channels that will be changed because of the project have uniform, flat gradients and thus do not now contain riffles. It is acknowledged that disturbance of the channels during construction will temporarily increase BOD (biochemical oxygen demand) and will thus temporarily reduce the oxygen content.

12. Comment: To what extent will the implementation of this project affect water levels, and, hence, plant and animal communities, of the 2,294 acres of wetlands located within the watershed?

The project, it seems, will change or accelerate a change in the character of type (25; Appendix D) of certain of the wetlands. For example, type 4 wetlands may be transformed in a comparatively short period of time to type 3 wetlands if the project were implemented.

Such environmental impact must be recognized and assessed.

Response: The planned measures will not affect water levels in the 2,294 acres of wetlands in the Oak Orchard Creek Watershed. The wetlands are due to natural depressions or blockages. There are no plans to remove these blockages, therefore, the plant and animal communities in question will not be affected. No technical assistance will be provided by SCS to allow the drainage of any type 3, 4, and 5, wetlands.

13. Comment: To what extent will the project affect the water levels and, hence, biological communities of the Oak Orchard (state) and Iroquois (national) Wildlife Refuges?

It seems that the levels of the ponds in these areas will be raised especially that of Stafford and Oxbow Ponds which are directly on the boundary of the watershed. Such potential and serious impacts are not assessed.

What genuine assurances can be made that the project will not result in these downstream, refuge-management areas being inundated by high waters during period of annual flooding?

Response: See Response to Genesee/Finger Lakes Regional Planning Board Comment No. 1. The project will not prevent annual flooding of the refuge management areas.

14. Comment: What effect, if any, will this project have on water levels of Lake Ontario?

Response: Due to the relative size of the Oak Orchard Watershed and the drainage area above Lake Ontario, the Oak Orchard project would have immeasurable impact on the water levels of Lake Ontario.

15. Comment: How extensive is flooding in the muckland area on an annual basis?

A chart showing the degree of annual flooding would be helpful to the public in assessing the real need for a flood control project in this region.

Response: See Response to Comment No. 2 of National Wildlife Federation comments.

16. Comment: Will recommendations for improving the habitat of game species be implemented? If so, this should be stated forthrightly.

Response: Game species habitat improvement is implemented by the individual landowners and operators at their discretion.

16A. Comment: The need for the use of herbicide in providing for wildlife habitat is specious, and indeed, questionable.

Response: Spraying was removed from Table Q.

16B. Comment: Excluding the general guidelines or recommendations for bettering habitat published by the Division of Fish and Wildlife, has the Fish and Wildlife Division or the Department of Environmental Conservation been directly consulted regarding plant and animal resource problems in the area, as in compliance with the Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq.?

Response: Yes, see discussion in "Consultation and Review with Appropriate Agencies and others" section. (II-60)

17. Comment: How much of a reduction in wind erosion from the muckland area can be expected from this project?

Response: Wind erosion rates will be reduced about 50 percent.

18. Comment: Muskrat activity, it seems, will be disturbed on a more than temporary basis (42) since maintenance activities, which, as designated, entail among other things removal of channel obstructions, are explicitly inimical to muskrat activity and their propagation. This impact must be properly assessed again by the sponsors.

Response: Present maintenance of the channel does not allow muskrats to construct houses within the channel. They therefore seek shelter in dens burrowed into the channel bank. Proposed maintenance will not change this pattern.

II. Economic Problems

1. Comment: Who will directly bear the cost of installing this project? Will there be cost sharing between the beneficiaries and the U.S. Department of Agriculture in order to fund the price of project installation?

Taxpayers who will not benefit from this project should not be made to pay for its installation. Only 350 people will directly benefit from the project (36, et passim), while only those living in, and adjacent to, the watershed, it seems,will benefit indirectly by minimizing flood damage to agricultural products (30, 36). Will the rest of those living in the watershed region benefit in any other way by the project?

Response: The federal government will provide funding for necessary engineering services, construction costs, and those project administration costs needed to ensure that structural measures are installed in accordance with plans and specifications. The Small Watershed District will fund the cost of acquiring landrights and for project administration costs incurred. Benefits such as improved tax base and increased employment will accrue to taxpayers in general. Direct project beneficiaries will be taxed to pay the Sponsor's share of the cost.

2. Comment: The fact that this project benefits, both directly and indirectly, such a comparatively small group of people, together with the fact that the project is predicated almost exclusively on small-scale economic concerns (1) raises important questions as to the priority and validity of this project? Can this project be truly justified in light of such facts?

Response: The project, evaluated in accordance with Senate Document 97, was found to possess a benefit/cost ratio of 2.0:1. See Appendix A.

3. Comment: Will the sump pumps proposed for installation be driven by gas or by electricity during periods of flooding?

Response: The decision pertaining to energy source will be made at the time of project installation and will be based on the type of energy most readily available at that time.

4. Comment: It should be explicitly, rather than implicitly, stated that this project will not effectively eliminate all floods in the area (9). Elsewhere in the draft statement the implication is strongly made that the project will eliminate all flooding conditions (45).

The "beneficiaries" of this project, who will be funding its operation and maintenance, must not be misled by the sponsors regarding the effective functions of the project. The limitations of this project should be admitted forthrightly, especially in view of the particular problem areas naturally high water table (15).

Response: Installation of structural measures will reduce annual floodwater damages to crops by 77 percent. Damages will be eliminated from storms up to the 10-year frequency events with some damages remaining from storms of greater magnitude.

III. Technical Problems

1. Comment: The boundaries of the watershed involved at Oak Orchard Creek should be explicitly delineated and justified by the sponsor.

There is considerable amount of confusion as to the meaning of the term "watershed" as used in the draft statement. The term, of course, has two standard uses: one referring to the actual piece of land or water which separates two contiguous drainage basins with opposite directions of flow, and the other referring to one of the regions or basins drained by a stream or body of water.

According to the Glossary of Geology (published by the American Geological Institute 1972), "the term (watershed)

when used alone is ambiguous, and, unless the context happens to suffice without aid from the word itself, the uncertainty of meaning entailed by this double usage makes the term undesirable.

Contextually, the second meaning is seemingly used in the draft statement. Yet the drainage basin of Oak Orchard Creek extends beyond the western boundary of the watershed as it is mapped in the draft statement. Moreover, the direction of water flow in Oak Orchard Creek is the same on either side of the western boundary of the "watershed."

It seems that the sponsors of this project have used the term "watershed" in some special way which should be explicitly stated or defined in the statement. The omission of such a definition suggests that boundaries, specifically the western boundary, were artificially drawn in order to deemphasize the impact which this project would have upon the environment.

In order to rectify the matter, a topographical map should be included in the statement which would clearly demarcate the actual watershed.

Response: Oak Orchard Creek Watershed is defined for purposes of the Environmental Impact Statement and is that area drained by portions of Oak Orchard Creek located above the Oak Orchard Wildlife Management Area. See Appendix B.

2. Comment: In view of the fact that the project's installation will increase, at least temporarily, sediment levels in water (8, et passim), present sediment damage related to sediment discharges (as well as potential sediment damage) should be assessed.

The omission of an evaluation of this environmental impact in the draft statement is a serious shortcoming of the document.

Response: There is no documentation that has been researched by this office that indicates that the present sediment discharge is causing any problems. In most instances, the sediment carrying capacity of Oak Orchard Creek is low due to low flow velocity and many natural quiet water areas where coarse sediments settle out. There have been no reports

of excessive bridge and culvert cleanout due to sedimentation or reduction in capacity of wildlife marshes. Therefore, unless damages are reported that can be related to sediment discharges, further assessment is unnecessary.

3. Comment: The rationale for adopting this project based upon the reduction of soil erosion it will effect is rather specious. As indicated in the draft statement (38), the locus of the soil erosion problem is poor tillage rotation of upland crop areas.

This problem can be rather easily rectified by proper land management and agricultural techniques, without an elaborate plan for land treatment, stream channelization, and other related structures such as those proposed by the draft statement.

Response: Recommended land treatment measures are specified in the "Planned Project" section. These measures include "proper land management and agricultural techniques" as recommended in the comment.

4. Comment: Environmental factors should be listed under the section entitled "Favorable Environmental Impacts," not solely social-economic effects (45ff).

This is not to imply that the latter are insignificant and should be omitted from the draft environmental statement. Yet the majority of environmental effects listed in this section should be concerned with the natural environment, not the social-economic setting as is the case with this particular draft statement. This is in accordance with Section 1500.8 (a) (3), in conjunction with Appendix II, of the Guidelines for the Preparation of Environmental Impact Statements issued by the Council on Environmental Quality in 1973.

Response: The section of the EIS cited by the comment does include changes in wind and water erosion rates, sediment deliveries, and sediment concentration in the water. These impacts are not "solely social-economic effects."

5. Comment: Secondary or indirect impacts upon the environment caused by the project, in compliance with Section 1500.8 (a) (3) of the aforementioned Guidelines issued by the Council on Environmental Quality, were not fully assessed in the draft statement.

Principally the indirect environmental impacts which this project will have upon the downstream areas within the Oak Orchard Creek drainage basin and adjacent areas were not properly recognized or evaluated.

Response: Secondary or indirect impacts induced by the project, such as increased peaks downstream and changed patterns in social and economic activities are discussed in the "Environmental Impact" section.(page II-46) Flood stages at the lower end of the Oak Orchard Wildlife Management Area will be increased about 0.1 foot for the 10-year frequency storm event. Induced flood peaks further downstream will be less than 0.1 foot. Peak runoff will not be reduced by the proposed project, therefore, the wildlife management areas will be able to fill the wetland areas under normal operating procedures.

This project will not cause any increased movement of people or the building of new industrial facilities.

6. Comment: Sufficient analysis of alternatives to the proposed site is seemingly lacking in the draft statement. The descriptions of such alternatives and their dynamics is inadequate.

Better effort should be made by the sponsors to have this section of the draft statement conform to Section 1500.8 (a) (4) of the Guidelines for Preparation of Environmental Impact Statements issued by the Council on Environmental Quality in 1973.

A natural sustaining system for flood control should be investigated as a possible alternative to the proposed project. Such a system utilizing existent ditches and streams with minimal modification, if any, together with small dams and several large pools or ponds may well afford adequate flood control as well as maintaining and, in some instances, enhancing the wildlife habitat of the region. These pools or storage basins together with Oxbows would maintain the flow of water, collect sediment, and increase percolation.

Response: Alternatives consisting of land treatment alone and land treatment in combination with dam and channel work were evaluated. It was determined that these alternatives would not achieve the desired results. No oxbows will be eliminated by proposed project measures.

7. Comment: The list of irreversible and irretrievable commitments of resources (55) is inadequate as only resources relating to labor and materials are included. According to the Guidelines for the Preparation of Environmental Impact Statements revised in 1973 by the Council of Environmental Quality, specifically Section 1500.8 (7), resources must include "the natural and cultural resources committed to loss or destruction by the (proposed) action."

Response: An archeological survey and a review of historical literature of the project area failed to indicate that the proposed project would destroy identified cultural resources (Appendix G). Thirty-nine acres of land would become committed to the project.

8. Comment: Technical terms, such as "borrow" etc., used in the draft statement are not explained or are explained improperly. Such terms should be explained contextually or be immediately defined so as to ensure proper understanding and scrutiny of the statement by the general public.

Response: The term "borrow" was changed to "fill".

UNITED STATES DEPARTMENT OF THE INTERIOR

I. Watershed Resources - Environmental Setting - Physical Data

1. Comment: There appears to be a contradiction in the discussion of erosion damage of steep cropland. Topography is described as "flat" or "nearly level" to "gently rolling". Yet, it is stated that erosion damage is occurring on "steep cropland". This same problem is pointed out in the Summary of the Plan.

Response: Although the topography is described as "flat" or "nearly level" it does contain areas of "steep cropland". (See Table F.)

II. Fish and Wildlife Resources

1. Comment: It is stated, "The density of these species (wetland wildlife) are determined by the abundance of open surface water and variety of aquatic vegetation." This might be more descriptively stated as: The density of these species is influenced by the amount and type of water body and vegetation, as well as their dispersion.

Response: Change made in wording as suggested.(page II-31)

III. Water and Land Resource - Table M - Needs and Recommendations for Improving Wildlife Habitat

1. Comment: Spraying of vegetation is not a recommended management practice for pheasants and woodcock. The detrimental effects to wildlife outweigh any benefits. Mention of spraying in the Addendum section also should be deleted.

Response: Change made as suggested.(II-44)

IV. Appendix E - Table of Songbirds and Birds of Prey

1. Comment: Since the list includes many species of waterfowl, shore birds, and waders, as well as those more commonly referred to as songbirds, it is suggested that the table title so reflect this. "Some Birds Known to Nest in and Near the Watershed" should suffice.

   Response: Appendix changed as suggested.

2. Comment: We understand that the watershed incurred damages as a result of tropical storm "Agnes" in June 1972, and that $40,000 was expended under Section 216 of Public Law 516 to clean the channels within the muckland in 1973. Some mention of this work and any effects on the proposed project should be made.

   Response: The effects of the channel cleanout have not been analyzed. The purpose of the "Section 216" work was to restore the channel to its pre-Agnes condition.

3. Comment: The draft environmental statement appears to be largely a repetition of the watershed work plan, and adequately presents the impacts of the project on environmental conditions as they exist today. Our comments on the work plan apply to the environmental statement as well.

   Response: Comment is noted.

NATIONAL WILDLIFE FEDERATION (COMMUNITY DESIGN ASSO.-CONSULTANT)

(1) Comment: GENERAL OBSERVATIONS

Much thought and effort has been put into the making of this report. For this, we sincerely commend Robert Hilliard, State Conservationist, and the U.S. Dept. of Agriculture. But as a professional group of planners, ecologists and landscape architects, committed to the wise use and understanding of the natural environment in the planning process, we must take issue with certain parts of the report and its main conclusions.

Response: Noted.

(2) Comment: CRITICISM

A. Hydrology

1) By far the most serious failing of the draft statement is its lack of understanding of basic river hydrology and watershed dynamics. The statement is concerned primarily and directly with the flood plain of Oak Orchard Creek, with the economic and social effects of annual flooding upon truck farming in the flood plain. Yet the word flood plain is mentioned but once in the whole statement, and that time in passing. Instead the creek's natural flood plain is referred to as muckland, and the tone of the statement is almost as if the creek has no business in this high-priced muckland. The truth of the matter is that the natural flood plain is as much a part of the river as the river water itself, that the flood plain is the most critical factor in river-creek dynamics; it accommodates high water from annual snow melts and spring rains; it holds back and distributes these excess overflows; it may even soak up excess water like a sponge, holding it in underground acquifers, which in turn are critical links in water table systems. Thus, as a general principle, it is entirely natural and desirable that any river - including Oak Orchard Creek - overflow into its flood plain. To construct a barrier separating the creek from its flood plain is to create an unnatural situation, a hydrological imbalance the consequences of which are ignored by the draft statement.

2) To dike as many miles of Oak Orchard Creek and its tributaries as the statement proposes is bound to effect (a) the ability of the creek to transport and disperse floodwater which would ordinarily have been handled by the flood plain and (b) the ability of the creek system to absorb water runoff from surrounding fields. The draft statement does not address itself to the question of what happens to this water runoff. It does not consider the probability that by constricting downstream channels and preventing them from efficiently draining upriver regions, the likelihood is increased that upriver and upstream regions never before flooded will be flooded.

Most critically, the draft statement does not concern itself with that portion of the creek that lies immediately below the area of proposed alteration. This region will be forced to absorb volumes of floodwater formerly accomodated by the upstream flood plain; this water is now suddenly released into the downstream region after being held in channel by the dikes.

A likely probability is that this downstream area, The Iroquois National Wildlife Refuge and two smaller refuges, will be affected very seriously, perhaps even totally destroyed as nature preserves, from floodwaters funnelled down by the proposed diking system. True, there is an area of swamp and approximately one mile of undiked creek between the proposed area of alteration and the refuges but this seems hardly enough to absorb the accumulation of water from 90.8 miles of dikes watercourse which formerly flooded some 4,500 acres. In any case, not even to consider the question appears irresponsible. In fact, the refuges and other downstream regions do not even appear on the project map.

In short, a proper hydrological analysis would have included the following:

- a proper analysis of the flood plain in terms of natural river dynamics in general and in terms of the properties of this creek in particular.

- a graphic presentation of flood plains (10 years to 50 years at least), wetlands and aquifers.

- a proper discussion and graphic delineation of the wildlife regions and downstream areas to be affected by the proposal.

Response:

In analyzing the Oak Orchard Creek Watershed Project, the primary problem area was identified as about 6,560 acres of muckland subject to periodic inundation. In this sense the term "muckland subject to inundation" is synonymous with "flood plain" and is used because it is more descriptive of the highly productive organic soil which will experience decreased flooding with the planned project.

The draft statement has been accused of having a lack of understanding of basic river hydrology and watershed dynamics. Watersheds with large complex flood plains, divided by dikes and roads, and with little or no hydraulic gradient cannot always be analyzed by standard procedures, i.e., water surface profiles and flood routing. It was therefore determined by the watershed staff, with concurrence from the Soil Conservation Service technical service center in Upper Darby, Pa., that floodwater damages on the muckland would be obtained through interviews of landowners and farm operators. It had been determined in previous studies of similar watersheds that by providing 10-year frequency flood protection on muck, annual damages would be reduced by about 85 percent. The 10-year frequency 24-hour storm was routed to establish discharges through the watershed area. Water surface profiles were computed to establish the hydraulic grade line for design channels. Backwater effects were considered starting at Knowlesville Road.

A concern is expressed for the region which lies immediately below the area of the proposed project. It is stated that " a likely probability is that this downstream area will be affected very seriously, perhaps even totally destroyed as nature preserves, from floodwaters funnelled down by the proposed diking system." However, alternatives were considered which included floodwater retarding structures to reduce storm water runoff. The state fish and wildlife agency reacted against these proposals because they felt the floodwater retarding structures would reduce spring runoff that is needed to fill the wetland wildlife areas each year.

It is agreed that peak discharges tend to be increased downstream when an increase in water velocity occurs through channel work. Due to the surface area size of the wildlife area, the increased peaks caused by the project will increase the surface elevation less than 0.1 foot for the 10-year design storm. Wetlands and aquifers are described in the Environmental Setting and the Wildlife Refuges are shown on Figure 11.

B. Environmental Analysis

1. Comment: It appears from that statement and from the map that the creek has already been channelized - even dikes - to some degree. This situation should have been thoroughly clarified by the statement. To implicitly justify continued diking and channelization on the basis of a previous commitment to a questionable result certainly does not seem to be the right approach.

Response: Development of the Oak Orchard muckland for agricultural production occurred about 50 years ago. The existing channels through the muck are described in the Environmental Setting as being manmade. The purpose was to provide water courses from the uplands to the watershed outlet and to allow drainage for agricultural production. Through an economic evaluation it has been determined that by providing flood protection to the crops substantial benefits can be derived.

New York State Department of Agriculture and Markets and universities have long advocated the development and conservation of the state's muck resources for agricultural production. No other land resource has the capability to produce vegetables equal to muck soils. More than ten percent of the total United States onion production is produced in New York State on muck soils. Many vegetables (known as soft vegetables) can only be produced on muck soils.

2. Comment: From the tone of the statement, as well as from its tables, charts and descriptions, Oak Orchard Creek appears to be pretty much of a loser as rivers go. The previous diking and channelization along the main watercourses has apparently eliminated large bankside vegetation, much of the original creek's pools and riffles, and other natural features. Additionally, the creek supports no trout, bass or any sport fish. Stress is placed on the fact that the proposed modifications will primarily affect muskrat activity in the channel, the implication being that not much else in the way of wildlife will be affected.

Response: Impacts on components of a food chain resulting from temporarily reducing quality and quantity of muskrat habitat have been added. (page II-33)

3. Comment: The point I am trying to make is threefold. A fair environmental analysis would have included the following:

- an accurate description of the creek before diking and channelization.

- an analysis of all life forms and ecosystems supported by the present channel: fish such as carp or suckers, amphibians, uses made by raccoons, herons, etc.

- an analysis of human uses and activity supported by the channel and fishing for trash fish, boating, wading or whatever.

- a recognition that however barren the channel may be in its life supporting capacities, the fact remains that diking and channelization of the channel will greatly affect the capacity of the surrounding wetlands to support the mink, muskrat, ducks, geese mentioned in the statement, as well as wildlife not mentioned.

Without a complete and fair environmental analysis, the creek appears barren and useless and it becomes easy to justify alternations such as those proposed.

Response: Our environmental assessment and evaluation was made under 1974 land use and conditions. There was no human utilization of the channel identified such as fishing, boating, and wading.

There is a life cycle associated with the channels which was evaluated and displayed in the "Plant and Animal Resource" section, page . The effects of the installation of the project measures are displayed in the "Environmental Impact" section, page II-46.

During construction the proposed project measures will have a short term affect (3 or 4 years) on the wildlife that are dependent upon this particular reach of Oak Orchard Creek. This is further discussed in the Environmental Impact" section, page II-46.

4. Comment: It seems highly irresponsible not to provide a complete description and tabulation of all herbicide, pesticides and amount thereof, to find out exactly what and how much of this is accumulating in the watershed and especially in the downstream nature refuges. My suspicion would be that 2, 4-D and perhaps even long lasting hydrocarbons such as Aldrin or Dieldrin (used on corn) might turn up in samples.

Response: Appendix F identifies chemicals found by the Environmental Protection Agency. Dicloro-diphenyl compounds have been banned for agricultural usages by EPA; consequently, quantities should diminish over time.

C. Land Use

1. Comment: From an ecological point of view, truck farming of onions, potatoes, etc., is the worst possible type of land use (outside of actual building) that could occur on a flood plain. The reason is that in row crop farming such as this, earth remains bare for relatively long periods of time in plowing, seeding, weed eradicating and harvest activities. Bare earth stripped of natural successional weed and grass cover, soaked in herbicide to suppress unwanted plant activity, is highly unstable and erodible even in most gentle April showers. In the annual spring flood, this land doesn't stand a chance. Plus it is soaked in nitrates, phosphates and herbicides, all of which can do no good to the ecosystem.

If improper land use lies at the core of the problem, should not consideration be given to ways in which patterns of flood plain land use might be modified or even changed altogether. (See Conclusion, "B".)

Response: The Elba muckland (developed muck) was cleared, drained, and consequently developed for agricultural production about 50 years ago; consequently, the production of truck crops on the muck would occur with or without installation of the proposed project. It is acknowledged that clean cultivation does have an effect on ecosystems. The developed muck does not support significant wildlife numbers per se; however, the developed muck in conjunction with the remaining undeveloped muck provides diversity of habitat and contributes to "edge" effects which from an ecological "point of view", are usually termed desirable. Development of the muck eliminated woodland and wetland wildlife habitat and created open land wildlife habitat. (See Table R.)

It is acknowledged that clean cultivation induces erosion; however, due to its level topography and its high rate of absorption, erosion rates on "bare" muckland are significantly lower than erosion rates on "bare" mineral soils. The project is designed to minimize erosion through the uses of water level control structures and the installation of land treatment measures.

The ecological point of view not withstanding, economics is a consideration in defining "best land use". The muck has in fact been developed for agricultural purposes and the market place has indicated that its "highest and best" economic use is the production of truck crops. Historically agriculture has developed on flood plains (i.e. Nile Valley and Mississippi Delta). Uplands become and remain productive only with significant subsidization (i.e. energy and fertilizers). As energy and fertilizer supplies appear to be limited, it may be considered rational to consider limited use of flood plains for food production. It is acknowledged that significant quantities of agrichemicals are utilized in the production of muckland truck crops (Table K); however, the project will reduce chemical applications and thus reduce quantities of these chemicals entering the streams.

(2) Comment: Conclusion

A. Re PROPOSED STRUCTURAL MEASURES (Dikes, water control structures, etc.)

Cost: $5,302,400.00

This system of diking and structures appears to be the worst possible way to approach the problem of flood plain flooding in the Oak Orchard Creek Watershed for the following reasons:

1) It is enormously expensive and possess a design life of admittedly only fifty years. Each farm is worth $78,000 (65 average acreage times $1,200 value per acre) and the cost of the entire project is $5,302,400.00 for 100 farms. This means that for each farm a sum of money will be spent that approaches the total value of the farm itself ($53,024), all for a fifty year project which I can't see standing up - much less operating efficiently - for thirty years. Plus - the long term maintenance costs are not even figured into the equation. It would be cheaper in the long run for the state to buy the 100 farms, establish flood plain and land use ordinances and sell back the farms to dairy or beef cattle farmers.

2) As an approach to a problem in hydrology and watershed dynamics, it nevertheless is based upon a faulty and incomplete understanding of watershed principles (See "A" Hydrology.)

3) It would create a series of consequences the implications of which are ignored by the draft statement. (See "A" Hydrology and "B" Environmental analysis.)

4) As a document in environmental analysis, it does not give us a fair or complete picture. (See "B" Environmental analysis.)

5) It is admittedly designed to control only the 10 year flood. What about the flood that occurs every 11 years? Or the big 25 or 40 year flood. What effect would these floods have on the system itself?

B. Re THE PROPOSED ALTERNATIVE: LAND TREATMENT

Cost: $1,800,000.00

This alternative puts forth the right approach since it hits at the root of the overall problem, that of improper land use in the flood plain. But although a good start, this alternative does not go far enough. Quite simply there must be more bait, more encouragement - both financial and legal. No farmer in his right mind is going to spend money on conservation methods unless encouraged to do so by a careful mixture of prodding and rewards. I list the following suggestions as to ways in which this proposed alternative (Land Treatment) could be "fleshed out":

1) Education programs to at least inform the farmer about the merits of cover crops and wetland crops versus bare earth crops in the flood plain.

2) Creation by local zoning and planning agencies of long range and short term development plans for the flood plain based on a proper evaluation of its best land use.

3) The awarding of credits and financial bonuses to farmers who adhere to proper land use practice.

4) A specific funded program of reforestation in the flood plain.

5) Encouraging participation by schools, 4-H clubs, Boy Scouts, Campfire Girls, etc., in planting trees and cover crops in the flood plain and in developing wildlife refuges.

6) Direct legal prohibition of flagrant land use violations and abuses. Consideration should be given to ways in which truck farming could be phased out, such as allowing the farm to exist as a truck farm for the life of the farm family, but no more.

(3) Comment: Summary

It should be stressed that the situation presented by the draft statement should not be thought of as a problem in which a river is flooding its flood plain and must be prevented from doing so. No matter how big or expensive the dike, this creek will find a flood plain to flood.

The problem is simply that improper use of the natural flood plain is being made. Any proposed solution which does not consider this improper use as the foundation of the problem is destined for eventual failure.

Response: Conclusion (2) and summary (3) of report are noted.

LIST OF APPENDIXES

APPENDIX A

Comparison of Benefits and Costs for Structural Measures

APPENDIX B

Project Map

APPENDIX C

Letters of Comment Received on Draft Environmental Impact Statement

APPENDIX D

Bibliography

APPENDIX E

Definition of Land Treatment Measures
Wetland Definitions
Wildlife Species Found in the Watershed Region
Birds of the Watershed
Oak Orchard - "A Wildlife Haven"
Description of Land Use Adjacent to the Watershed Streams

APPENDIX F

Oak Orchard Creek Survey prepared by the U.S. Environmental Protection Agency

APPENDIX G

Archeological Survey Within the Proposed Oak Orchard Watershed Project

APPROVED BY Robert L. Hilliard

DATE 11/24/75

APPENDIX A

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Oak Orchard Creek Watershed, New York

(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/		Total Benefits	Average Annual Cost 3/	Benefit Cost Ratio
	Reduction	Secondary			
All Structural Measures	501,500	50,100	551,600	249,200	2.2:1
Project Administration	: : : :	: : :	: : : :	25,200	: : :
GRAND TOTAL	501,500 2/	50,100	551,600	274,400	2.0:1

1/ Price base: Adjusted normalized prices (1966).
2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $52,800 annually.
3/ Price base: 1974

May 1975

APPENDIX B

78°15′ 78°10′ 78°05′

43°10′

43°05′

LEGEND

- First class road
- Second class road
- Gravel road
- Watershed boundary
- County line
- Township line
- Railroad
- Streams
- Marsh
- T 195+00 — Channel designation and stationing
- Area benefited

PROJECT MEASURES

- Open channel (Main) and appurtenances (Sumps)
- Floodway (Lateral) and appurtenances (Sumps)
- Floodwater diversion (Interceptor) and appurtenances (Sumps)

MANNING MUCK
250 Ac.

ELBA MUCK
6310 Ac.

N

Barre Ctr
East Barre
Braggs Corners
S Barre
Langton Corners
ELBA
Dows
Oak Orchard Creek
Oak Orchard Road
McNamara Road
Central
Penn
Basin Road
ORLEANS COUNTY
GENESEE COUNTY
BARRE
BATAVIA

WMN 325+00
TE 57+00
T 195+00
TE 0+00
SMN 128+00
SMN 0+00
SMW 80+00
SMW 0+00
S 219+83
S 0+00
T 25+00

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PROJECT MAP

OAK ORCHARD CREEK WATERSHED

GENESEE AND ORLEANS COUNTIES
NEW YORK

0 4,000′ 8,000′ 12,000′ 16,000′
Scale in Feet

May 1974

USDA-SCS-HYATTSVILLE, MD. 1974

APPENDIX C

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
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31 OCT 1974

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

This is in response to your letter of 9 September 1974 addressed to Commandant, U. S. Coast Guard concerning a draft environmental impact statement for the Oak Orchard Creek Watershed, Genesee and Orleans Counties, New York.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

W. E. Caldwell

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION II
FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

October 9, 1974

OFFICE OF THE
REGIONAL DIRECTOR

Our Reference: ROFEC

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
Department of Agriculture
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

Subject: Draft EIS # 037-09-74
Oak Orchard Creek Watershed,
Genesee and Orleans Counties,
New York

On the basis of our review of the above, we have determined that the impacts in those areas of concern to this Department have been adequately addressed. We have no adverse comment in relation to the implementation of this project.

Sincerely yours,

Charles S. Josinsky
Regional Environmental Officer

RONALD W. PEDERSEN
FIRST DEPUTY COMMISSIONER

STATE OF NEW YORK
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY

November 6, 1974

Dear Mr. Hilliard:

Draft Enviromental Impact Statement
Oak Orchard Creek Watershed
Genesee and Orleans Counties, New York
DEC Project No. 800-99-0065

We have reviewed the above noted document and believe that it adequately discusses the environmental impacts that may result from implementation of the proposed project. Our recommendations which were incorporated into the watershed work plan should minimize adverse effects resulting from the project, particularly on adjacent wildlife refuges.

Thank you for the opportunity to review this statement.

Sincerely,

Ronald W. Pedersen

Mr. Robert L. Hilliard
State Conservationist
United States Department
of Agriculture
Soil Conservation Service
Room #400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

cc: H. Stamatel BIVENS

C-4

Advisory Council
On Historic Preservation
1522 K Street N.W. Suite 430
Washington D.C. 20005

October 25, 1974

Mr. Robert L. Hilliard
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
Room 400, Midtown Plaza
700 East Water Street
Syracuse, New York, 13210

Dear Mr. Hilliard:

This is in response to your request of September 9, 1974, for comments on the environmental statement for the Oak Orchard Creek Watershed, Genessee and Orleans Counties, New York. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your draft environmental statement appears procedurally adequate. However, a copy of the comments received from the State Historic Preservation Officer should be included in the environmental statement.

Should you have any questions or require any additional assistance, please contact Mr. Stephen Cochran (202) 254-3974 of the Advisory Council staff.

Sincerely yours,

for John D. McDermott
Director, Office of
Review and Compliance

Orleans
Community
Action
Committee, Inc.

ADMINISTRATIVE OFFICES:
29 East Bank Street
Albion, New York 14411
Telephone: 716-589-5605

UMBRELLA AGENCY FOR:
Head Start
Health Start
People's Opportunity
Family Planning Services
Neighborhood Youth Corps
Eastern Orleans Community Center

September 27, 1974

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
700 East Water Street
Syracuse, New York

Dear Sir:

Enclosed you will find a copy of a report done for us by Dr. F. R. Fosberg, Cuator of Botany at the Smithsonian Institution, concerning the gorge area of Oak Orchard Creek. It certainly should be included in the final environmental statement you will be issuing for the Oak Orchard Creek Watershed Project.

It is our understanding that the rough draft of this statement has been published and is available for study and consideration. Could you please send us a copy so that we may make it available to interested persons, including our Board of Supervisors, in this area?

Thank you very much.

Very truly yours,

D. L. Raynor

D. L. Raynor, EFMS
Coordinator

June 8, 1974

REPORT ON RECREATIONAL, EDUCATIONAL AND SCIENTIFIC POTENTIAL OF LOWER OAK ORCHARD CREEK GORGE

The lower five miles of Oak Orchard Creek, from the hydro-electric dam to Lake Ontario, is probably the most scenically spectacular feature of Orleans County, New York. The Creek, here, forms a series of incised meanders, cut into a flat, strongly bedded fine-grained purple and green shale. The surrounding terrain is rather flat and almost featureless, and very intensively cultivated. The river channel is cut about 100 feet into this plain, about 50 feet of it below lake-level.

This land-form would be called an estuary if the stream emptied into the sea and were subject to tidal influence. There does not seem to be a name for similar features on lake coasts. The fact that a channel of such depth extends well away from the lake suggests that the channel may have been cut before the lake attained its present level. Perhaps the best comparison is with the fjords in the far north and far south. Possibly the best term for this feature might be "minifjord."

The walls of the fjord are 50 foot cliffs of crumbly shales covered with a hardwood forest with some mixture of evergreens. This forest includes a remarkable diversity of species of trees and large shrubs, at least 25 different species. Flowering dogwood occurs here in one of its very northern stations. Several exotic trees and shrubs, such as weeping willow and bush honeysuckle have become established in this forest, adding a different character to parts of it.

Certain areas of the gorge have become filled with sediment up to near the water's surface, providing habitats for water-lilies, pond-weeds of several sorts, water-milfoil, and other aquatics. Where such areas have built up to the surface, marsh plants have become established, holding and consolidating the mud and forming marshes. These are being invaded by several kinds of shrubs and trees.

Near the upper end of the gorge, on the west side is a small flood-plain, mostly covered with forest.

During a short boat trip up the creek a number of kinds of birds were seen, even though it was a bright sunny day, not at all good for bird-watching. Several mallard ducks were seen on the creek. Red-winged blackbirds were abundant. A beautiful blue kingfisher was plying his trade.

Fish were jumping and a considerable number of people in boats were enjoying an afternoon of quiet angling.

The lower mile of the fjord, below "The Bridges" has considerable "development" along both banks, including several marinas. The deep sheltered water makes it ideal for this purpose, and the proximity of Lake Ontario provides ample space for sailing, cruising and speedboating. This part has been rather spoiled for anything but mass-recreation purposes.

The four miles or so from the dam and railroad bridge down to "The Bridges", while not in truly "pristine" condition, is still rather little disturbed. If somehow brought into public ownership it could, with very little but protection, provide a permanently superb site for the more passive forms of recreation--bird watching, fishing, photography, sketching, canoing, and general relaxation and enjoyment of beautiful surroundings.

This whole section of the stream and its gorge is potentially on extremely valuable site for biological education and research. Besides standard studies of fauna, flora, vegetation, fresh-water and marsh ecology, several special features provide opportunities for unusual lines of investigation. The shale-cliff habitat poses special problems as a substrate for forest growth. These would repay a careful study and long-term observation.

Ecological comparison of this fresh-water "fjord" type of situation with a true estuary with tidal fluctuation and a salinity gradient would yield interesting insight into the functioning of both these aquatic ecosystems. Long term observation and monitoring of selected measurable features would teel us much about the capacity of sites of this sort to maintain themselves under light to moderate recreational use. Of course, this would only be feasible if the intensity of such use could be regulated.

The stream and reservoir above the dam are, of course, subject to considerable pollution. Certain polluting substances such as detergents, fertilizer chemicals, sewage bacteria, pesticides, and heavy metals could be monitored where the water issues from the hydroelectric plant at the dam and at selected intervals down-stream. Simultaneous sampling of aquatic organisms with statistics recorded as to the kinds present and their numbers would give a useful insight into the effects of these pollutants on various classes of living organisms.

Rates of erosion, siltation, and sediment movement could also be monitored to clarify rates of these processes and their relation to vegetational change and succession.

These are only a sample of studies that could be integrated into a program of practical and theoretical ecological research. The area could become an important "outdoor laboratory" for ecology and environmental studies for the educational institutions of the county and surrounding areas if protection and stability could be provided. This could include not only the college programs but, equally importantly, natural history studies by high school and grade school classes and gifted budding scientists. Such studies will certainly become more and more important and popular as more leisure time is available and as environmental problems become more and more critical.

Over and above the actual and potential uses just detailed, the preservation for ourselves and our posterity of such an area of unique natural beauty if important for its own sake. The continued existance of beauty really needs no justification. Beauty is what adds savour and satisfaction to life, and compensation for life's troubles and discomforts.

The problem of providing protection for this area is unquestionably a difficult one. The lands bordering the creek are in private hands--mostly in large tracts, but along the middle section of the east bank, an area cut up into small lots wi th summer cottages and shacks, some with stairways down the cliffs to mostly makeshift boat-landings. Several areas where roads are close to the cliff-tops are used as rubbish-dumps. These, as well as speed-boating, are incompatible uses. The only remedies would be outright purchase of the lands bordering the creek, at least a narrow strip on both sides, or acquisition of scenic or ecological easements on these strips. The magnitude of this problem would seem to preclude any solution but public ownership. Projects of this magnitude have been handled by the Nature Conservancy and National Audubon Society but only where wealthy people were interested enough to give the land or to donate large sums of money to buy it.

It would seem that the best chance of protection and preservation of the Oak Orchard Gorge would be either as a county or state park, or as a natural area under state or county jurisdiction. The relative merits of these alternatives have not been determined or at least are not known to me for New York conditions. Laws and policies on these matters vary from state to state, and even from county to county. Normally a protected natural area affords better and more permanent protection, but local practicalities should be considered. It would scarcely seem practical, for example, to prohibit the moderate amount of amateur fishing that is done there.

I have as certained that the New York State Department of Enviromental Resources has authorized a one billion dollar bond issue for such purposes as parks and natural areas. This is said to be available through the Department to local jurisdictions, especially those which have established Municipal Conservation Commissions. The Department of Enviromental Resources is encouraging the formation of such commissions in local jurisdictions where these or equivalents do not already exist. I would strongly urge that a body of this sort be established in Orleans County or in the Town of Albion, in order to take advantage of grants from the one billion dollar fund that has recently become available. Then, immediately a proposal for protection of the Oak Orchard Creek Gorge can be developed and submitted to the Department. This should be initiated as promptly as possible, as the demands on this fund will be so heavy that it will not last long.

Information on the avenues to follow in applying for help from the fund, also the way to form a Municipal or County Conservation Commission may be secured by writing to Mr. Charles Morrison, New York State Department of Environmental Resources, Albany, N.Y.

Orleans County has, in this gorge of Oak Orchard Creek, a natural feature of great beauty and great scientific interest. I cannot urge too strongly that the civic and conservation minded people of the county get busy on this at once. The education interests in Orleans and neighboring counties should be willing to put their weight behind such a project. Their own use of the Gorge does not seem incompatible with the aims outlined above.

This report is the best that I can prepare in the time available and with the information gathered on a short visit to the area on June 5, 1974. It was indeed a privilege to be able to make this visit and to enjoy the beauty and scientific interest of this unique "mini-fjord." I wish you every success in preserving it for others to enjoy for a long time to come.

Respectfully submitted,

Dr. F.R. Fosberg
Curator of Botany
Smithsonian Institute
Washington, D.C.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

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Class. ER-2

Mr. Robert L. Hilliard
U.S. Department of Agriculture
Soil Conservation Service
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

We have reviewed the draft environmental impact statement for the Oak Orchard Creek Watershed in Genesee and Orleans Counties, New York and have the following comments.

A stream survey of Oak Orchard Creek was conducted in accordance with a signed agreement between EPA Region II and the Soil Conservation Service (SCS). The main purpose of the survey was to supplement existing water quality data and to assist SCS in the preparation of the EIS for the Oak Orchard Creek Watershed. Information from this survey, however, has not been incorporated into the draft EIS. The final EIS should incorporate the results of this survey.

The heavy metal analyses of the survey indicate that significant amounts of zinc and lead are concentrated in the stream sediments. Although the results of biological investigations indicate that the macroinvertebrate population of these sediments are not greatly affected by these toxicants, the heavy metal analyses "do stress a need for caution during construction to minimize disturbance of these bottom sediments." The effects of the disturbance of these sediments on wildlife should be discussed in the final EIS.

The EIS reports that the channel work would take place on only one side of the drainage ditches so as not to totally disrupt the wildlife habitat which exists there. However, beyond saying that cattails and other emergent aquatic vegetation grow and that muskrat inhabit the area, little is said about the existing wildlife. A complete discription of the ecosystems in the project area should be included in the final EIS.

The statement says that most of the proposed channel work will follow the existing ditch alignments. Where will the new alignments around the muck area be located and what will be done with the abandoned ditches?

Originally, the project was to encompass 82,937 acres of the watershed as opposed to the present 39,860 acres. The final EIS should discuss the reason for expanding the scope of the project.

Thank you for the opportunity to review this EIS. All additional information requested should be included in the final EIS. Three copies of the final EIS are requested for subsequent review.

Sincerely yours,

Barbara Metzger

for Paul H. Arbesman
Chief
Environmental Impacts Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

FEB 20 1975

Mr. Robert L. Hilliard
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

We have reviewed the Soil Conservation Services' responses to EPA's comments to the draft impact statement for the Oak Orchard Creek Watershed, New York and find them to be acceptable.

Thank you for the opportunity to review these responses. Three copies of the final EIS will be appreciated.

Sincerely yours,

John B. Gemeiz for

Paul H. Arbesman
Chief
Environmental Impacts Branch

GENESEE/FINGER LAKES REGIONAL PLANNING BOARD
Suite 500, Ebenezer Watts Building, 47 South Fitzhugh Street, Rochester, New York 14614
716-232-1060

November 7, 1974

Mr. Robert L. Hilliard, State Conservationist
USDA - Soil Conservation Service
Room 400 Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Re: Oak Orchard Creek Watershed
Draft Environmental Impact
Statement

Dear Mr. Hilliard:

The Genesee/Finger Lakes Regional Planning Board has reviewed and circulated the DEIS for the Oak Orchard Creek Watershed Project. Copies of the comments we received are attached and should be considered during the preparation of the Final EIS.

Generally, we found the statement to be complete particularly when considered in conjunction with the Work Plan. The handling of significant impacts - soil, erosion, flooding, economic costs and benefits within the project area was thorough. The following specific comments are offered for your consideration in preparing the final EIS:

1) The environmental impact on the three public Wildlife Management areas - Oak Orchard, Tonawanda and Iroquois - are not adequately addressed. The report only mentions that "early decision was made to formulate project measures which would not result in consumption use of water" and acknowledges concern on the part of residents. The impact on these areas particularly on wildlife and water levels must be included.

2) While the project is basically designed to improve economic conditions in the area, there may be a recreation potential which should be considered.

3) Will the benefits to agriculture result in the increased use of fertilizer and herbicides? The run-off from fertilizer and herbicides could affect water quality in both the project area and downstream.

4) The list of review agencies does not include the Great Lakes Basin Commission, it is suggested that they be included in the future.

With regard to the Preliminary Regional Development Plan (December 1973), the project while not specifically mentioned, is consistent with the plan. The Regional Plan shows this area as unique agriculture. Route 98 is an intraregional rural link on the plan. A potential recreation area is indicated in the general area near the Orleans/Genesee County Line.

Finally, the Regional Planning Board strongly endorses the project based on the expected economic benefits to accrue and the handling of significant impacts within the project area. We appreciate the opportunity to comment upon the statement and look forward to receiving the Final Environmental Impact Statement.

Sincerely,

Margaret Ely

Margaret Ely
Assistant Planner
Planning Assistance

ME:cb

C-15

DEPARTMENT OF PLANNING

PLANNING BOARD

3837 WEST MAIN STREET ROAD
BATAVIA, NEW YORK
PHONE (716) 343-1182

October 17, 1974

Ms. Maggie Ely
Planning Assistance Division
Genesee/Finger Lakes Regional Planning Board
Suite 500 - Ebenezer Watts Building
47 So. Fitzhugh Street
Rochester, New York 14614

Dear Maggie:

The enclosed comments result from our review of the preliminary draft of the environmental impact statement for the Oak Orchard Watershed Project.

Please forward our comments to the appropriate agents of the sponsors for their consideration.

Thank you for your attention.

Sincerely,

M. Kevin Woods, Environmental Planner
Genesee County Dept. of Planning

MKW:vmm
Enc.
cc. Bill Surrey, Genesee County SCS

REVIEW OF ENVIRONMENTAL IMPACT STATEMENT - OAK ORCHARD CREEK WATERSHED PROJECT

1. The impact statement makes only casual mention of the possible downstream effects of this project, particularly the effects on water levels and, consequently, wildlife in the Oak Orchard, Iroquois, and Tonawanda wildlife refuge. The report acknowledges concern on the part of the state and local residents as to the downstream effects of this project, yet the report (particularly the impact statement) does not address downstream effects nor do these effects enter into the cost-benefit calculations.

2. The report notes that migrant families will benefit from the increased incomes to the muck-farmer through some increases in wages, family income, etc. This seems to be a significant social justification for the project. Based on prevailing wage rates, land-owner practices, and owner-migrant relationships in the area, the sponsor should attempt to quantify this benefit. Essentially, there should be some calculated "guess" as to the amount of benefit the migrant worker will receive from this project, and how far will it go in reducing the noted "gap between the living standards of the farm labor families and the general population".

3. The statement is generally complete, though at times sketchy in detail. This office feels the primary considerations of importance in reviewing this project are as follows:

A. The effects of the project on unique wetland areas downstream. These are lands held by the public for the protection of wildlife and the enjoyment of the public and are thus a public trust.

B. The number of groups in the community that can be identified as receiving a positive benefit from this project. This benefit may be quantifiable, as this project is being undertaken to provide economic benefits, or non-quantifiable, though in this case these are likely to be less significant.

C. The effects on the environment within the immediate project area.

11-11-74 - copy to Henry Stamatel

C-17

Genesee West Audubon Society
Clifton, New York 14431
November 7, 1974

Mr. Robert L. Hilliard, State Conservationist
United States Department of Agriculture
Soil Conservation Service
Room 400
Midtown Plaza
700 East Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

Enclosed is Genesee West Audubon Society's critique on the draft Environmental Impact Statement on Oak Orchard Creek Watershed for Genesee and Orleans counties, New York, which has been filed with the Council on Environmental Quality. Obviously we have many questions and serious concerns about this proposed project. We assume that we will be informed as you proceed further in this project. We also assume that we will hear regarding our questions on the project as soon as possible. We are very interested and watchful of this project.

Thank you very much.

Sincerely,

Douglas H. Merchant

Douglas H. Merchant, President
Genesee West Audubon Society

November 4, 1974

To: Soil Conservation Service, U.S. Dept. of Agriculture

From: Genesee West Audubon Society, Clifton, New York 14431

Re: Draft Environmental Statement on Oak Orchard Creek Watershed

The Genesee West Audubon Society, in keeping with the policy of the National Audubon Society, is opposed to any and all flood control projects which involve stream channelization.

Stream channelization destroys diversified vegetative habitat for mammals, birds, fish, and other forms of wildlife. This destruction is both direct--for example, the elimination of streambank vegetation by actual construction of channels by means of dredging, etc.--and indirect--for example, the elimination of adequate fish habitat because of the increase in the turbidity and temperature of the water in the channel.

Moreover, we feel that stream channelization is predicated on an intellectually naive and potentially dangerous view of the nature and the dynamics of our most precious natural resource, water. Ecologist John Storer states that in order to be useful water "must be delayed on its journey to the sea and distributed so as to render the greatest amount of service." (The Web of Life, p. 85). Stream channelization projects preclude this sound ecological tenet of water management. By permitting quick and unimpeded removal of water from a particular "problem" area, stream channelization prevents the water table (the underground store of water) in that area from being adequately replenished by means of water percolation through the soil.

We aver that the quality of water in, and downstream from, the particular area is also degraded by stream channelization. Such degradation is generally a product of several factors enhanced by channelization, including high turbidity due to the fast rate of water flow through channels, erosion of soil along channel sides due to rapid flow rates, and increase in the mineral content of the water due to leaching from dike walls and channel sides. The increment of nutrient levels in the water combined with the increase in water temperature, due to the effects of widening as well as the virtually open and exposed nature of the channels, frequently stimulates growth of algae in great masses or "blooms" which further fouls the water. Finally, stream channelization projects decrease the oxygen content of water, a vital aspect of water quality. The decrease is effected because any and all barriers or obstacles in the course of the channel which generate rapids and riffles, thus aerating the water, are removed as a general rule of operation and maintenance procedure.

The Genesee West Audubon Society realizes that flood control projects entailing streamchannelization of a certain designated area invariably cause flood problems for downstream areas, with in many cases, were previously unaffected by flooding. We are keenly cognizant of this grave irony, and are adamantly opposed to such displacement of flood problems.

BODY OF THE CRITIQUE:

To facilitate examination, comments and points of criticism will be listed below in itemized fashion under three separate headings: 1) Environmental Problems, under which will be included assessments of the environmental impacts of the proposed project and questions which the Genesee West Audubon Society raises regarding these and potential impacts; 2) Economic Problems, under which will be included questions and comments regarding the social-economic ramifications of the project; and, 3) Technical Problems, under which will be included comments regarding flaws in the preparation of the Draft Environmental Statement on the Oak Orchard Creek Watershed.

In compliance with Section 1500.9 (e) of the Guidelines for Preparation of Environmental Impact Statements mandated by the Council on Environmental Quality in 1973, our comments will be specific and substantive as possible. Comments and questions under each section will generally follow the manner in which information occurs in the text of the draft statement. Numbers in parentheses refer to pagination of the Draft Environmental Statement.

I. Environmental Problems

1. How much of an increase in sediment will this project initially effect if installed? Will this increase in sediment be incurred throughout the entire seven year installation period?

   Detriment to the water quality of the area and to the mouth of the watershed, specifically the eastern edge of Oak Orchard Game Management Area, due to increased sediment deposits, would result if great increments of sediment were produced over such a long period of time.

2. Channel work, as proposed, will further expose mineral soil, thus increasing the amount of leaching from the bed and sides of channel.

3. Roadbanks, dikes, and spoil areas should <u>in all cases</u> be covered with muck or muck soil to facilitate rapid growth of vegetation in order to minimize soil erosion and leaching.

   Conflicting information regarding this matter occurs in the statement: in one section it is stated that such covering will only be done where muck is "available" (5), and elsewhere it is implied that muck will be applied to all the above structures (8, et passim).

4. Strict provisions, and not merely "guidelines" (7) should be made in all cases to reduce pollution and erosion at the construction sites.

   As alluded to above, all exposed areas should be protected from wind and water in all cases.

5. Will reseeding or restocking with cuttings or shrubs be carried out using seeds and/or plants of different genetic types?

   If not, the resultant monoculture due to its lack of genetic diversity and, hence, adaptability potential, will be strongly susceptible to disease, etc.

6. What parameters will be employed to time maintenance activities so that minimal damage wil be done to wildlife (8)?

7. Excavation of material from just one side of the stream to be channelized will not preclude total destruction of wildlife habitat in most cases, as is implied by the draft statement (7). Such a quantitative view of wildlife habitat as that implicit in the statement reflects naivete and a lack of knowledge of fundamental ecology.
Wildlife habitat must be grasped and understood in more qualitative rather than quantitative terms. While excavation of one streambank may not directly affect the opposite bank, it is patently foolish to suggest that this action will not indirectly jeopardize and destroy wildlife habitat on this bank.

8. During the annual flood periods, approximately how rapid will water be flowing through all three types of channels? What are the present rates of water flow in drainage ditches and Oak Orchard Creek during these periods?

   It seems that the project, as proposed, merely displaces the problem of soil erosion from the 4500 acres of upland crop area to the banks and sides of channel or laterals.

9. To what extent will the ground water levels in the watershed be reduced by this project? How will the water tables in other areas of the Oak Orchard Creek drainage basin be affected?

   Such reductions and their impacts must be carefully assessed by the sponsors of this project.

10. The project as proposed will invariably result in the total destruction of the warm water fishery in Oak Orchard Creek near Fisher Road. The existence of this sport fishery is revealed in Table G (22).

    The impact which this project will have upon this fishery is not recognized or assessed. The text of the Environmental Statement states explicitly that no sport fisheries exist within channels to be modified, yet the fishery is approximately 1500 feet from where the proposed channelization of Oak Orchard Creek ends (Appendix B). Turbidity and other factors engendered by this project will in all probability destroy this fishery.

    The omission of such a grave environmental impact is a most serious flaw of the draft statement.

11. What will be the approximate oxygen content of the water as a result of this project?

    It seems that a definite reduction of dissolved oxygen would be effected by this project due to the removal of natural "aerators" such as rocks and other obstacles, which generate rapids and riffles, (9, et passim). Such a reduction would have deleterious impact upon fish and other aquatic organisms.

The elimination of this natural aeration system will also jeopardize the purity and quality of the water in the area.

12. To what extent will the implementation of this project affect water levels, and, hence, plant and animal communities, of the 2,294 acres of wetlands located within the watershed?

The project, it seems, will change or accelerate a change in the character or type (25; Appendix D) of certain of the wetlands. For example, type 4 wetlands may be transformed in a comparatively short period of time to type 3 wetlands if the project were implemented.

Such environmental impact must be recognized and assessed.

13. To what extent will the project affect the water levels and, hence, biological communities of the Oak Orchard (state) and Iroquois (national) Wildlife Refuges?

It seems that the levels of the ponds in these areas will be raised, especially that of Stafford and Oxbow Ponds which are directly on the boundary of the watershed. Such potential and serious impacts are not assessed.

What genuine assurances can be made that the project will not result in these downstream, refuge-management areas being inundated by high waters during period of annual flooding?

14. What effect, if any, will this project have on water levels of Lake Ontario?

15. How extensive is flooding in the muckland area on an annual basis?

A chart showing the degree of annual flooding would be helpful to the public in assessing the real need for a flood control project in this region.

16. Will recommendations for improving the habitat of game species be implemented? If so, this should be stated forthrightly.

The need for the use of herbicide in providing for wildlife habitat is specious, and indeed, questionable.

Excluding the general guidelines or recommendations for bettering habitat published by the Division of Fish and Wildlife, has the Fish and Wildlife Division or the Department of Environmental Conservation been directly consulted regarding plant and animal resource problems in the area, as in compliance with the Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq.?

17. How much of a reduction in wind erosion from the muckland area can be expected from this project?

18. Muskrat activity, it seems, will be disturbed on a more than temporary basis (42) since maintenance activities, which, as designated, entail among other things removal of channel obstructions, are explicitly inimical to muskrat activity and their propagation. This impact must be properly assessed again by the sponsors.

II. Economic Problems

1. Who will directly bear the cost of installing this project? Will there be cost-sharing between the beneficiaries and the U.S.Dept. of Agriculture in order to fund the price of project installation?

   Taxpayers who will not benefit from this project should not be made to pay for its installation. Only 350 people will directly benefit from the project (36, et passim), while only those living in, and adjacent to, the watershed, it seems, will benefit indirectly by minimizing flood damage to agricultural products (30, 36). Will the rest of those living in the watershed region benefit in any other way by the project?

2. The fact that this project benefits, both directly and indirectly, such a comparatively small group of people, together with the the fact that the project is predicated almost exclusively on small-scale economic concerns (1) raises important questions as to the priority and validity of this project. Can this project be truly justified in light of such facts?

3. Will the sump pumps proposed for installation be driven by gas or by electricity during periods of flooding?

4. It should be <u>explicitly</u>, rather than implicitly, stated that this project will not effectively eliminate all floods in the area (9). Elsewhere in the draft statement the implication is strongly made that the project will eliminate all flooding conditions (45).

   The "beneficiaries" of this project, who will be funding its operation and maintenance, must not be misled by the sponsors regarding the effective functions of the project. The limitations of this project should be admitted forthrightly, especially in view of the particular problem areas naturally high water table (15).

III. Technical Problems

1. The boundaries of the watershed involved at Oak Orchard Creek should be explicitly delineated and justified by the sponsor.

   There is a considerable amount of confusion as to the meaning of the term "watershed" as used in the draft statement. The term, of course, has two standard uses: one referring to the actual piece of land or water which separates two contiguous drainage basins with opposite directions of flow, and the other referring to one of the regions or basins drained by a stream or body of water.

   According to the Glossary of Geology (published by the American Geological Institute, 1972), "the term (watershed) when used alone is ambiguous, and, unless the context happens to suffice without aid from the word itself, the uncertainty of meaning entailed by this double usage makes the term undesirable."

Contextually, the second meaning is seemingly used in the draft statement. Yet the drainage basin of Oak Orchard Creek extends beyond the western boundary of the watershed as it is mapped in the draft statement. Moreover, the direction of water flow in Oak Orchard Creek is the same on either side of the western boundary of the "watershed."

It seems that the sponsors of this project have used the term "watershed" in some special way which should be explicitly stated or defined in the statement. The omission of such a definition suggests that boundaries, specifically the western boundary, were artificially drawn in order to deemphasize the impact which this project would have upon the environment.

In order to rectify the matter, a topographical map should be included in the statement which would clearly demarcate the actual watershed.

2. In view of the fact that the project's installation will increase, atleast temporarily, sediment levels in water (8, et passim), present sediment damage related to sediment discharges (as well as potential sediment damage) should be assessed.

   The omission of an evaluation of this environmental impact in the draft statement is a serious shortcoming of the document.

3. The rationale for adopting this project based upon the reduction of soil erosion it will effect is rather specious. As indicated in the draft statement (38), the locus of the soil erosion problem is poor tillage rotation of upland crop areas.

   This problem can be rather easily rectified by proper land management and agricultural techniques, without an elaborate plan for land treatment, stream channelization, and other related structures such as those proposed by the draft statement.

4. Environmental factors should be listed under the section entitled, "Favorable Environmental Impacts," not solely social-economic effects (45ff).

   This is not to imply that the latter are insignificant and should be omitted from the draft environmental statement. Yet the majority of environmental effects listed in this section should be concerned with the natural environment, not the social-economic setting as is the case with this particular draft statement. This is in accordance with Section 1500.8 (a) (3), in conjunction with Appendix II, of the Guidelines for the Preparation of Environmental Impact Statements issued by the Council on Environmental Quality in 1973.

5. Secondary or indirect impacts upon the environment caused by the project, in compliance with Section 1500.8 (a)(3) of the aforementioned Guidelines issued by the Council on Environmental Quality, were not fully assessed in the draft statement. Principally, the indirect environmental impacts which this project will have upon the downstream areas within the Oak Orchard Creek drainage basin and adjacent areas were not properly recognized or evaluated.

6. Sufficient analysis of alternatives to the proposed action is seemingly lacking in the draft statement. The descriptions of such alternatives and their dynamics is inadequate.

   Better effort should be made by the sponsors to have this section of the draft statement conform to Section 1500.8 (a)(4) of the Guidelines for Preparation of Environmental Impact Statements issued by the Council on Environmental Quality in 1973.

   A natural sustaining system for flood control should be investigated as a possible alternative to the proposed project. Such a system utilizing existent ditches and streams with minimal modification, if any, together with small dams and several large pools or ponds may well afford adequate flood control as well as maintaining and, in some instances, enhancing the wildlife habitat of the region. These pools or storage basins together with Oxbows would maintain the flow of water, collect sediment, and increase percolation.

7. The list of irreversible and irretrievable commitments of resources (55) is inadequate as only resources relating to labor and materials are included. According to the Guidlines for the Preparation of Environmental Impact Statements revised in 1973 by the Council on Environmental Quality, specifically Section 1500.8 (7), resources must include "the natural and cultural resources committed to loss or destruction by the (proposed) action."

8. Technical terms, such as "borrow," etc., used in the draft statement are not explained or are explained improperly. Such terms should be explained contextually or be immediately defined so as to ensure proper understanding and scrutiny of the statement by the general public.

Respectfully submitted,

Douglas H. Merchant

Douglas H. Merchant, President
Genesee West Audubon Society
Clifton, New York 14431

242 Brooks Avenue
Rochester, New York
14619
January 2, 1975

Mr. Robert Hilliard
Soil Conservation Service
U.S. Department of Agriculture
Water Street
Syracuse, New York 13210

Dear Mr. Hilliard:

I am writing regarding our December 9th meeting in Batavia with officials from the Genesee County Soil and Water Conservation District and muck-growers in the region concerning the Oak Orchard Creek Watershed project sponsored by the USDA. On behalf of the Genesee West Audubon Society, Mr. Merchant and I would like to express our appreciation for this opportunity to elucidate our remarks and concerns stated in our critique of the Oak Orchard Creek Watershed DEIS submitted to your office several months ago. We found the meeting to be most beneficial in clarifying various aspects of the watershed project and in answering many of the questions posed in our critique of the project.

However, we still have several reservations regarding the Oak Orchard Creek Watershed plan. Most of these deal with the discussion of the project- its various aspects and probable effects- presented in the draft environmental impact statement (DEIS) on the watershed program.

Firstly, several of the questions we initially had were clarified by material in the draft Work Plan for the Oak Orchard Creek Watershed issued early last year which was supplied to us at the December 9th meeting. The Work Plan explicitly states that "no induced downstream flood damages have been identified" (p. 51). No mention of possible downstream flooding is made in the DEIS, suggesting that this potential impact was not considered or assessed by the sponsors. Also, the DEIS, unfortunately, does not contain the structural data found in Table 3A of the Work Plan which shows that the soil erosion problem is not simply being displaced.

As we stated at the meeting, this material in the Work Plan is of crucial importance for a proper understanding of the project, and must not be excluded from the final EIS on the Oak Orchard Creek Watershed plan. The data contained in Table 3A of the Work Plan is, indeed, rather technical, and should be included in the appendices of the EIS, in compliance with Section 1500.8(a)(1) of the Guidelines for the Preparation of EIS's, issued by the Council on Environmental Quality (CEQ) and incorporated into the Federal Register in 1973.

The source(s) of this latter, as well as other significant, information should also be included in the final EIS as it is supplied in the Work Plan (pp. 61-64). The fact that the 85% flood reduction projected for this project is based upon the results of a flood control project in the Flint Creek Watershed which effected the same reduction must be stated in the EIS on the watershed project. The studies and/or analyses, upon which the observations and conclusions

contained in any EIS are based, must be included in the statement pursuant to Section 1500.8(b) of the Guidelines for the Preparation of EIS's enacted by the CEQ.

Secondly, certain terminology and phraseology within the DEIS is rather misleading. The use of the term "watershed", which normally denotes a drainage basin, to describe the area affected by the project, is especially confusing when what is meant is a "small watershed" or sub-watershed of the Oak Orchard Creek watershed or drainage basin. Also the statement that the channels will "follow the alignment of existing ditches" (p. 4, et passim) suggests that these structures will be constructed parallel to these ditches, following the same general contours of the latter. The language here does not make it sufficiently clear that the channels will share generally the same bed as the existing ditches. These cases of misleading language should be rectified in the final EIS, as we intimated at the December 9th meeting.

Thirdly, there are several omissions and/or inadequacies in the DEIS which were delineated in our critique of the latter under the section entitled "Technical Problems". After having evaluated the information received at our meeting with SCS representatives in Batavia, we still stand behind our comments stated in the aforementioned section, specifically # 2,4,5,7, and 8. As you recall, these comments dealt with 1) the absence of an analysis of present and projected sediment damages due to sediment discharges, 2) irrelevant material in the section on "Favorable Environmental Impacts", 3) inadequate consideration of secondary or indirect potential impacts of the project, 4) deficiencies in the section on "Irreversible and Irretrievable Committments of Resources", and, 5) inadequate explanation of certain technical terms. We urge that these inadequacies be corrected in the final EIS in accordance with the federal Guidelines for the Preparation of EIS's, approved in 1973.

Fourthly, several discrepancies regarding the project, as presented in the DEIS, are evident. An internal discrepancy concerning mulching has already been cited in our critique (Comment #3 under "Environmental Problems"). Another discrepancy involves the maintenance procedures delineated in the statement. We were informed at our December 9th meeting that the ditches or channels would not be mowed, and that wildlife (ducks, muskrats, etc.), which nested in the channel or along its banks, would not be adversely affected by maintenance measures. Yet in the DEIS (p. 9) it states that operation and maintenance entails the "mowing the ditches". Maintenance also involves "cleaning the ditches" (p. 9) which strongly suggests that obstacles, such as muskrat "huts", would be removed from the channels. The latter action, of course, would adversely affect the muskrat population in the area. The third discrepancy is in connection with the monitoring of water quality. (See below.) These discrepancies should be rectified in the final EIS on the project.

Lastly, we still stand behind our comments, # 4, 7, 13, and 16b, under the section entitled "Environmental Problems".

In lodging these criticisms of the Oak Orchard Creek Watershed project with your office, the intent of the Genesee West Audubon Society is not to create more paperwork for the SCS, necessitating the spending of more time and money. Our concern and intent is that local environmental organizations, besides our own, and interested members of the public be guaranteed a thorough and lucid understand-

ing of this project. The primary concern and intent of the Genesee West Audubon Society in citing the faults of the DEIS, however, is our conviction that the National Environmental Policy Act (NEPA) of 1969 and the corollary Guidelines for the Preparation of EIS's be respected and upheld. It is recognized by our organization that the institution of the environmental impact statement (EIS) is an important tool for creating and maintaining "productive harmony" between Man and his environment during present and future generations.

Perhaps our greatest reservation regarding the project itself is its potential effects on the downstream refuge areas, Oak Orchard Game Management Area (state) and Iroquois Wildlife Refuge (federal). We are specifically concerned with the expanse of swampy woodland, west of Fisher Road, through which Oak Orchard Creek winds sluggishly. We wonder whether this area would be inundated or otherwise adversely affected during periods of muckland flooding should the project be implemented. We would also very much like to know the basis for the contention, voiced by SCS representatives at our meeting, that the refuge areas, in general, will not be affected by the watershed program.

It was our understanding from the December 9th meeting that the EPA was currently monitoring water quality, specifically, dissolved oxygen content, of Oak Orchard Creek in the vicinity of Fisher Road. However, according to the DEIS (p. 23) such monitoring is only being conducted upstream from the "problem area". In the event that monitoring of dissolved oxygen content is not being conducted downstream of the project area, i.e., in the vicinity of the refuges, we request that such monitoring be done. We feel that the widening of ditches or channels may possibly raise the water temperature, thereby inducing the growth of algal blooms, which would increase BOD (biological oxygen demand).

In accordance with Section 1500.9(e)(3) of the Guidelines for the Preparation of EIS's, incorporated into the Federal Register in 1973, the Genesee West Audubon Society requests that turbidity also be monitored at a site immediately downstream from the "watershed" area.

We request that these two indices of water quality be monitored during the construction of the channels, etc. for this project. We request, furthermore, that, if dissolved oxygen content is ever consistently recorded below 4.00 ppm, or if turbidity ever registers below the N.Y.S. standard for turbidity for Inland Surface Waters on a consistent basis, the project be terminated immediately.

Finally, we were rather surprised to learn at our meeting December 9th that no public hearing was being planned for the purpose of reviewing the DEIS issued in September. We were informed then that there had been a hearing on the Oak Orchard Creek Watershed project last spring. (Genesee West Audubon Society received no notice of this event, however.) Such procedure concerning public hearings is, indeed, rather anomalous since a hearing is generally conducted after a DEIS has been issued and some time has been given to review the document.

As far as we are concerned, however, our critique, the December 9th meeting, and this communique have essentially served the same purposes as the format of a public hearing would have done. We have, therefore, decided not to petition your office for a public hearing on this project. However, we do wish that our comments above be in-

corporated into, or, rather, be attached to, the final EIS on the Oak Orchard Creek Watershed.

On behalf of the Genesee West Audubon Society, I thank you for the attention you have given our comments on the Oak Orchard Creek project, and for this opportunity to follow up on those comments.

Sincerely,

Michael E. Carlson

cc. Mr. William C. Surrey, Genesee County Soil and Water Conservation District
Mr. Richard C. Rhindress, National Audubon Society.

United States Department of the Interior

OFFICE OF THE SECRETARY
NORTHEAST REGION
JOHN F. KENNEDY FEDERAL BUILDING
ROOM 2003 J & K
BOSTON, MASSACHUSETTS 02203

ER 74/1163

November 7, 1974

State Conservationist, Soil Conservation Service
United States Department of Agriculture
Room 400 - Midtown Plaza
700 East Water Street
Syracuse, New York 13210

This constitutes our review of your draft environmental statement and Work Plan for Flood Protection, Oak Orchard Creek Watershed, Genesee and Orleans Counties, New York. Our comments are provided in response to your September 17, 1974, letter to Assistant Secretary Vogeley.

We understand that the planned project now consists of land treatment and structural measures. Structural measures include about 100 appurtenances for water control and about 90 miles of channel work. The two proposed dry dam reservoirs upstream from the muck land have now been eliminated from the project.

Watershed Resources - Environmental Setting - Physical Data

There appears to be a contradiction in the discussion of erosion damage of steep crop land on Pages 6 and 8. Topography is described as "flat" or "nearly level" to "gently rolling." Yet, it is stated that erosion damage is occurring on "steep crop land." This same problem is pointed out on Page 1 in the Summary of Plan.

Fish and Wildlife Resources

It is stated, "The density of these species (wetland wildlife) are determined by the abundance of open surface water and variety of aquatic vegetation." This might be more descriptively stated as: The density of these species is influenced by the amount and type of water body and vegetation, as well as their dispersion.

Water and Land Resource - Table M - Needs and Recommendations for Improving Wildlife Habitat

Spraying of vegetation is not a recommended management practice for pheasants and woodcock. The detrimental effects to wildlife outweigh any benefits. Mention of spraying in the Addendum section, Page 7, should also be deleted.

Appendix B Table of Songbirds and Birds of Prey

Since the list includes many species of waterfowl, shore birds, and waders, as well as those more commonly referred to as songbirds, it is suggested that the table title so reflect this. "Some Birds Known to Nest in and Near the Watershed" would suffice.

We understand that the watershed incurred damages as a result of tropical storm "Agnes" in June 1972, and that $40,000 was expended under Section 216 of Public Law 516 to clean the channels within the muck land in 1973. Some mention of this work and any effects on the proposed project should be made.

The draft environmental statement appears to be largely a repetition of the watershed work plan, and adequately presents the impacts of the project on environmental conditions as they exist today. Our comments on the work plan apply to the environmental statement as well.

Sincerely yours,

Roger Sumner Babb
Special Assistant to
the Secretary

National Wildlife Federation

1412 16TH ST., N.W., WASHINGTON, D.C. 20036 Phone: 202-483-15!

December 12, 1974

Mr. Joseph W. Haas
Assistant Deputy Administrator
for Watershed
USDA-SCS
Room 5225, South Building
12th & Independence Avenue
Washington, D.C. 20250

Dear Joe:

Enclosed herewith is a copy of the comments recently submitted by A. W. Browning, Jr., a National Wildlife Federation consultant, on the Oak Orchard Creek Watershed Project Draft Environmental Statement. I hope you give these comments and the entire proposal your personal attention before it gets past the point of no return. From what our consultant says, your people can get the necessary part of the job done a better way.

Sincerely,

Oliver A. Houck
Counsel

cc New York State Conservation Council
E. Warner Shedd
A. W. Browning, Jr.

National Wildlife Federation

INCORPORATED 1938 IN THE DISTRICT OF COLUMBIA

THOMAS L. KIMBALL
Executive Vice President

Our Objectives

TO ENCOURAGE THE INTELLIGENT MANAGEMENT OF THE LIFE SUSTAINING RESOURCES OF THE EARTH — ITS PRODUCTIVE SOIL — ITS ESSENTIAL WATER SOURCES — ITS PROTECTIVE FORESTS AND PLANTLIFE — AND ITS DEPENDENT WILDLIFE — AND TO PROMOTE AND ENCOURAGE THE KNOWLEDGE AND APPRECIATION OF THESE RESOURCES, THEIR INTERRELATIONSHIP AND WISE USE, WITHOUT WHICH THERE CAN BE LITTLE HOPE FOR A CONTINUING ABUNDANT LIFE.

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[illegible] Committee

Officers and Directors of the National Wildlife Federation serve without salary.

COMMENT AND REVIEW

By A. W. Browning, Jr., Associate and Chief Consultant in landscape architecture to Community Design Associates (CODA), an environmental planning firm located in Cos Cob, Connecticut. The firm relies heavily on watershed analysis as a tool in assessing the impact of man on his environment.

SUBJECT

Draft Environmental Statement
Oak Orchard Creek Watershed
Genesee and Orleans Counties, New York
Prepared by the U. S. Department of Agriculture
Soil Conservation Service
Syracuse, New York .

GENERAL OBSERVATIONS

Much thought and effort has been put into the making of this report. For this, we sincerely commend Robert Hilliard, State Conservationist, and the U. S. Dept. of Agriculture. But as a professional group of planners, ecologists and landscape architects, committed to the wise use and understanding of the natural environment in the planning process, we must take issue with certain parts of the report and its main conclusions.

CRITICISM

A. Hydrology

1) By far the most serious failing of the draft statement is its lack of understanding of basic river hydrology and watershed dynamics. The statement is concerned primarily and directly with the floodplain of Oak Orchard Creek, with the economic and social effects of annual flooding upon truck farming in the floodplain. Yet the word floodplain is mentioned but once in the whole statement, and that time in passing. Instead, the creek's natural floodplain is referred to as muckland, and the tone of the statement is almost as if the creek has no business in this high-priced muckland. The truth of the matter is that the natural floodplain is as much a part of the river as the river water itself, that the floodplain is the most critical factor in river-creek dynamics; it accommodates high water from annual snow melts and spring rains; it holds back and distributes these excess overflows; it may even soak up excess water like a sponge, holding it in underground acquifers, which in turn are critical links in water table systems. Thus, as a general principle, it is entirely natural and desirable that any river - including Oak Orchard Creek - overflow into its floodplain. To construct a barrier separating the creek from its floodplain is to create an unnatural situation, a hydrological imbalance the consequences of which are ignored by the draft statement.

2) To dike as many miles of Oak Orchard Creek and its tributaries as the statement proposes is bound to effect (a) the ability of the creek to transport and disperse floodwater which would ordinarily have been handled by the floodplain and (b) the ability of the creek system to absorb water run-off from surrounding fields. The draft statement does not address itself to the question of what happens to this water run-off. It does not consider the probability that by constricting downstream channels and preventing them from efficiently draining upriver regions, the likelihood is increased that upriver and upstream regions never before flooded will be flooded.

Most critically, the draft statement does not concern itself with that portion of the creek that lies immediately below the area of proposed alteration. This region will be forced to absorb volumes of flood water formerly accomodated by the upstream floodplain; this water is now suddenly released into the downstream region after being held in channel by the dikes.

A likely probability is that this downstream area, The Iroquois National Wildlife Refuge and two smaller refuges, will be affected very seriously, perhaps even totally destroyed as nature preserves, from flood waters funnelled down by the proposed diking system. True, there is an area of swamp and approximately one mile of undiked creek between the proposed area of alteration and the refuges but this seems hardly enough to absorb the accumulation of water from 90.8 miles of diked watercourse which formerly flooded some 4,500 acres. In any case, not even to consider the question appears irresponsible. In fact, the refuges and other downstream regions do not even appear on the project map.

In short, a proper hydrological analysis would have included the following:

- a proper analysis of the flood plain in terms of natural river dynamics in general and in terms of the properties of this creek in particular.

- a graphic presentation of floodplains (10 years to 50 years at least), wetlands and aquifers.

- a proper discussion and graphic delineation of the wildlife regions and downstream areas to be affected by the proposal.

B. Environmental Analysis

1. It appears from that statement and from the map that the creek has already been channelized - even diked - to some degree. This situation should have been thoroughly clarified by the statement. To implicitly justify continued diking and channelization on the basis of a previous commitment to a questionable result certainly does not seem to be the right approach.

2. From the tone of the statement, as well as from its tables, charts and descriptions, Oak Orchard Creek appears to be pretty much of a loser as rivers go. The previous diking and channelization along

the main watercourses has apparently eliminated large bankside vegetation, much of the original creek's pools and riffles, and other natural features. Additionally, the creek supports no trout, bass or any sport fish. Stress is placed on the fact that the proposed modifications will primarily affect muskrat activity in the channel, the implication being that not much else in the way of wildlife will be affected.

3. The point I am trying to make is threefold. A fair environmental analysis would have included the following:

   - an accurate description of the creek before diking and channelization

   - an analysis of all life forms and ecosystems supported by the present channel: fish such as carp or suckers, amphibians, uses made by raccoons, herons, etc.

   - an analysis of human uses and activity supported by the channel and fishing for trash fish, boating, wading or whatever

   - a recognition that however barren the channel may be in its life supporting capacities, the fact remains that diking and channelization of the channel will greatly affect the capacity of the surrounding wetlands to support the mink, muskrat, ducks, geese mentioned in the statement, as well as wildlife not mentioned.

Without a complete and fair environmental analysis, the creek appears barren and useless and it becomes easy to justify alterations such as those proposed.

4. It seems highly irresponsible not to provide a complete description and tabulation of all herbicide, pesticides and amounts thereof, to find out exactly what and how much of this is accumulating in the watershed and especially in the downstream nature refuges. My suspicion would be that 2,4-D and perhaps even long lasting hydrocarbons such as Aldrin or Dieldrin (used on corn) might turn up in samples.

C. Land Use

1. From an ecological point of view, truck farming of onions, potatoes, etc. is the worst possible type of land use (outside of actual building) that could occur on a flood plain. The reason is that in row crop farming such as this, earth remains bare for relatively long periods of time in plowing, seeding, weed eradicating and harvest activities. Bare earth stripped of natural successional weed and grass cover, soaked in herbicide to suppress unwanted plant activity, is highly unstable and erodible even in most gentle April showers. In the annual spring flood, this land doesn't stand a chance. Plus it is soaked in nitrates, phosphates and herbicides, all of which can do no good to the ecosystem.

2. If improper land use lies at the core of the problem, should not consideration be given to ways in which patterns of flood plain land use might be modified or even changed altogether. (see Conclusion, "B")

Conclusion

A) Re PROPOSED STRUCTURAL MEASURES (Dikes, water control structures, etc.

Cost: $5,302,400.00

This system of diking and structures appears to be the worst possible way to approach the problem of floodplain flooding in the Oak Orchard Creek watershed for the following reasons:

1. It is enormously expensive and possess a design life of admittedly only fifty years. Each farm is worth $78,000 (65 average acreage times $1,200 value per acre) and the cost of the entire project is $5,302,400.00 for 100 farms. This means that for each farm a sum of money will be spent that approaches the total value of the farm itself ($53,024), all for a fifty year project which I can't see standing up - much less operating efficiently - for thirty years. Plus - the long term maintenance costs are not even figured into the equation. It would be cheaper in the long run for the state to buy the 100 farms, establish floodplain and land use ordinances and sell back the farms to dairy or beef cattle farmers.

2. As an approach to a problem in hydrology and watershed dynamics, it nevertheless is based upon a faulty and incomplete understanding of watershed principles. (See "A" Hydrology)

3. It would create a series of consequences the implications of which are ignored by the draft statement. (See "A" Hydrology and "B" Environmental analysis.)

4. As a document in environmental analysis, it does not give us a fair or complete picture. (See "B" Environmental analysis.)

5. It is admittedly designed to control only the 10 year flood. What about the flood that occurs every 11 years? Or the big 25 or 40 year flood. What effect would these floods have on the system itself?

B) Re THE PROPOSED ALTERNATIVE: LAND TREATMENT

Cost: $1,800,000.00

This alternative puts forth the right approach since it hits at the root of the overall problem, that of improper land use in the floodplain. But although a good start, this alternative does not go far enough. Quite simply there must be more ~~bait~~ BAIT, more encouragement - both financial and legal. No farmer in his

right mind is going to spend money on conservation methods unless encouraged to do so by a careful mixture of prodding and rewards. I list the following suggestions as to ways in which this proposed alternative (Land Treatment) could be "fleshed out":

1. Education programs to at least inform the farmer about the merits of cover crops and wetland crops versus bare earth crops in the floodplain.

2. Creation by local zoning and planning agencies of long range and short term development plans for the flood plain based on a proper evaluation of its best land use.

3. The awarding of credits and financial bonuses to farmers who adhere to proper land use practice.

4. A specific funded program of reforestation in the floodplain.

5. Encouraging participation by schools, 4-H clubs, Boy Scouts, Campfire Girls, etc. in planting trees and cover crops in the floodplain and in developing wildlife refuges.

6. Direct legal prohibition of flagrant land use violations and abuses. Consideration should be given to ways in which truck farming could be phased out, such as allowing the farm to exist as a truck farm for the life of the farm family, but no more.

Summary

It should be stressed that the situation presented by the draft statement should not be thought of as a problem in which a river is flooding its floodplain and must be prevented from doing so. No matter how big or expensive the dike, this creek will find a floodplain to flood.

The problem is simply that improper use of the natural floodplain is being made. Any proposed solution which does not consider this improper use as the foundation of the problem is destined for eventual failure.

APPENDIX D

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APPENDIX E

DEFINITION OF LAND TREATMENT MEASURES

Conservation Cropping System (acres): Growing crops in combination with needed cultural and management measures. Cropping systems include rotations that contain grasses and legumes as well as rotations in which the desired benefits are achieved without the use of such crops.

Crop Residue Use (acres): Using plant residues to protect cultivated fields during critical erosion periods.

Field Windbreak (feet): A strip or belt of trees or shrubs established within or adjacent to a field.

Irrigation System, Sprinkler (number): A planned irrigation system where all necessary facilities have been installed for the efficient application of water for irrigation by means of perforated pipes or nozzles operated under pressure.

Irrigation System-Subsurface: A planned irrigation system where all necessary water control structures have been installed for the efficient distribution of irrigation water by surface means such as furrows, borders, contour levees or contour ditches, or by subsurface means.

Pumping Plant For Water Control (number): A pumping facility installed to transfer water for a conservation need, including removing excess surface or ground water; filling ponds, ditches, or wetlands; or for pumping from wells, ponds, streams, and other sources.

Subsurface Drain (feet): A conduit, such as tile, pipe, or tubing, installed beneath the ground surface and which collects and/or conveys drainage water.

Contour Farming: Farming sloping cultivated land in such a way that plowing, preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces, diversions, or contour strips.)

Drainage Main or Lateral (feet): An open drainage ditch constructed to a designed size and grade. Does not include Drainage Field Ditch.

Agricultural Waste Management System (number): A planned agricultural waste management system to contain and manage liquid and solid wastes including runoff from concentrated waste areas with ultimate disposal in a manner which does not degrade air, soil or water resources. This practice includes systems for safe disposal of livestock wastes, municipal waste treatment plant effluents and sludges, and agricultural processing wastes through use of soil and plants.

Disposal Lagoon (number): An impoundment made by constructing an excavated pit, dam, embankment, dike, levee, or combination of these, for biological treatment of organic wastes. (Does not include holding ponds and tanks.)

Minimum Tillage (acres): Limiting the number of cultural operations to those that are properly timed and essential to produce a crop and prevent soil damage.

Diversion (feet): A channel with a supporting ridge on the lower side constructed across the slope.

Mulching (acres): Applying plant residues or other suitable materials not produced on the site to the soil surface.

Grassed Waterway or Outlet (acres): A natural or constructed waterway or outlet shaped or graded and established in vegetation suitable to safely dispose of runoff from a field, diversion, terrace, or other structure.

Holding Ponds and Tanks (number): A fabricated structure or one made by constructing a pit, dam or embankment or combination thereof, for temporary storage of animal or agricultural wastes, associated runoff and waste water. (Does not include Disposal Lagoon.)

Stripcropping, Field: Growing crops in a systematic arrangement of strips or bands across the general slope (not on the contour) to reduce water erosion. The crops are arranged so that a strip of grass or close-growing crop is alternated with a clean-tilled crop or fallow.

Pasture and Hayland Management (acres): Proper treatment and use of pastureland or hayland.

Pasture and Hayland Planting (acres): Establishing and reestablishing long-term stands of adapted species of perennial, biennial, or reseeding forage plants. (Includes Pasture and Hayland Renovation. Does not include Grassed Waterway or Outlet on cropland.)

Pond (number): A water impoundment made by constructing a dam or embankment, or by excavating a pit or "dugout".

Fishpond Management (number): Developing or improving impounded water to produce fish for domestic use or recreation.

Deferred Grazing (acres): Postponing grazing or resting grazing land for a prescribed period.

Livestock Exclusion (acres): Excluding livestock from an area where grazing is not wanted.

Proper Grazing Use (acres): Grazing at an intensity which will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation.

Field Border (feet): A border or strip of perennial vegetation established at the edge of a field by planting or by converting it from trees to herbaceous vegetation or shrubs.

Tree Planting (acres): Planting tree seedlings or cuttings.

Recreation Area Improvement (acres): Establishing grasses, legumes, vines, shrubs, trees, or other plants or selectively reducing stand density and trimming woody plants to improve an area for recreation.

Recreation Land Grading and Shaping (acres): Altering the surface of land to meet the requirement of recreation facilities.

Recreation Trail and Walkway (feet): A pathway prepared especially for pedestrian, equestrian, and cycle travel.

Access Road (feet): A road constructed as a part of a conservation plan to provide needed access.

Wildlife Watering Facility (number): Constructing, improving, or modifying watering facilities for wildlife.

Wildlife Upland Habitat Management (acres): Retaining, creating or managing wildlife habitat other than wetland.

Wildlife Wetland Habitat Management (acres): Retaining, creating, or managing wetland habitat for wildlife.

Critical Area Planting (acres): Planting vegetation such as trees, shrubs, vines, grasses, or legumes on critical areas. (Does not include tree planting mainly for wood products.)

Mulching (acres): Applying plant residues or other suitable materials not produced on the site to the soil surface.

WETLAND DEFINITIONS

The following is a definition of wetland types as per "Wetlands of the United States," Circular 39, USDI, Fish and Wildlife Service, Washington, D. C., 1971.

Type 3, "Inland Shallow Fresh Marshes" - The soil is usually waterlogged during the growing season. Often it is covered with up to 6 inches or more of water. The vegetation contains such species as cattails, bulrushes, and arrowheads. Waterfowl and marsh birds use the area for feeding and nesting.

Type 4, "Inland Deep Fresh Marshes" - Water is usually less than 10 feet deep. Vegetation is pondweeds, water lilies, coontail, and other submerged aquatics, highly used by waterfowl.

Type 5, "Inland Open Fresh Water" - Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation. Vegetation includes pondweeds, naiads, wild celery, coontail,water milfoils, musk grasses, water lilies, and spatterdocks. Where vegetation is plentiful, they are used as nesting and feeding areas by ducks, geese and coots, especially during migration.

Type 6, "Shrub Swamps" - The sod is usually waterlogged during the growing season and is often covered with as much as 6 inches of water. They contain vegetation such as alders, buttonbrush, dogwoods, etc. They provide some food value for wood duck, wood cock, black duck, deer and rabbit. Songbirds also use the area for nesting.

Type 7, "Wooded Swamps" - The soil is waterlogged at least to within a few inches of its surface during the growing season and is often covered with as much as one foot of water. They contain tree species of willow, red maple, elm (large portion dead due to dutch elm disease) and some white cedar and when bordering water, nesting is provided for wood and black ducks. Habitat is also provided for deer and songbirds with an occasional grouse.

Wildlife Species
Found in the Watershed Region

Fish Species[1/]

central mudminnow
redfin pickerel
northern pike
carp
black bullhead
golden skinner
tadpole madtom
pumpkinseed
largemouth bass
common bluegill
brook stickleback
yellow perch
bluntnose minnow

Nongame Mammals[2/]

Virginia Opossum
Starnose Mole
Hairytail Mole
Masked Shrew
Shorttail Shrew
Little Brown Myotis
Big Brown Bat
Red Bat
Shorttail Weasel
Longtail Weasel
River Otter
Striped Skunk
Red Fox
Gray Fox
Indiana Myotis
Keen Myotis
Small-footed Myotis
Eastern Pipistrel
Southern Bog Lemming
Pine Vole
Bobcat
Woodchuck
Eastern Chipmunk
Red Squirrel
Beaver
White-footed Mouse
Meadow Vole
Norway Rat
House Mouse
Meadow Jumping Mouse
Woodland Jumping Mouse
Porcupine
Snowshoe Hare
Smoky Shrew
Pigmy Shrew
Least Shrew
Silver-haired Bat
Hoary Bat
Southern Flying Squirrel
Deer Mouse

Reptiles[2/]

spotted turtle
snapping turtle
painted turtle
water snake
brown snake
garter snake
milk snake

Amphibians[2/]

spotted salamander
blue spotted salamander
red backed salamander
red spotted newt
American toad
spring peeper
bullfrog
green frog
lepord frog
wood frog
grey toe frog

1/ New York State Department of Environmental Conservation Survey Data.
2/ Iroquois National Wildlife Refuge Survey Data.

Birds of the Watershed 1/

Common Loon
Horned Grebe
*Pied-billed Grebe
*Great Blue Heron
*Green Heron
Cattle Egret
Common Egret
Black-crowned Night Heron
*Least Bittern
*American Bittern
Glossy Ibis
Whistling Swan
*Canada Goose
Snow Goose
Blue Goose
*Mallard
*Black Duck
Gadwall
*Pintail
*Green-winged Teal
European Widgeon
American Widgeon
*Shoveler
*Wood Duck
Redhead
Ring-necked Duck
Canvasback
Greater Scaup
Lesser Scaup
Common Goldeneye
Bufflehead
Oldsquaw
White-winged Scoter
Common Scoter
Ruddy Duck
*Hooded Merganser
Common Merganser
Red-breasted Merganser
*Turkey Vulture
Sharp-shinned Hawk
Cooper's Hawk
*Red-tailed Hawk
*Red-shouldered Hawk
Broad-winged Hawk
Rough-legged Hawk
Golden Eagle
Bald Eagle
*Marsh Hawk
Osprey
Peregrine Falcon
*Sparrow Hawk
*Ruffed Grouse
*Ring-necked Pheasant
*King Rail
*Virginia Rail
*Sora
*Common Gallinule
*American Coot
Semipalmated Plover
*Killdeer
American Golden Plover
Black-bellied Plover
*American Woodcock
Common Snipe
*Upland Plover
*Spotted Sandpipe
Solitary Sandpipe
Greater Yellowlegs
Lesser Yellowlegs
Pectoral Sandpipe
Least Sandpipe
Dunlin
Short-billed Dowitcher
Semipalmated Sandpipe
Marbled Godwit
Wilson's Phalarope
Glaucous Gull
Herry Gull
Ring-billed Gull
Bonaparte's Gull
Common Tern
*Black Tern
*Mourning Dove
Yellow-billed Cuckoo
*Black-billed Cuckoo
*Screech Owl
*Great Horned Owl
Snowy Owl
*Barred Owl
Long-eared Owl
Short-eared Owl
Saw-whet Owl
Whip-poor-will
Common Nighthawk
Chimney Swift
*Ruby-throated Hummingbird
*Belted Kingfisher
*Yellow-shafted Flicker
*Pileated Woodpecker
Red-bellied Woodpecker
Red-headed Woodpecker
Yellow-bellied Sapsucker
*Hairy Woodpecker
*Downy Woodpecker
Northern 3-toed Woodpecker
*Eastern Kingbird
*Great Crested Flycatcher
*Eastern Phoebe
*Traill's Flycatcher
*Least Flycatcher
*Eastern Wood Pewee
*Horned Lark
*Tree Swallow
*Bank Swallow
Rough-winged Swallow
*Barn Swallow
*Cliff Swallow
Purple Martin
*Blue Jay
*Common Crow
*Black-capped Chickadee
*White-breasted Nuthatch
Red-breasted Nuthatch
Brown Creeper
House Wren
Winter Wren
*Long-billed Marsh Wren
*Short-billed Marsh Wren
Mockingbird
*Catbird
*Brown Thrasher
*Robin

1/ Iroquois National Wildlife Refuge Survey Data

*Wood Thrush
Hermit Thrush
Swainson's Thrush
*Veery
*Eastern Bluebird
Blue-gray Gnatcatcher
Golden-crowned Kinglet
Ruby-crowned Kinglet
Water Pipit
Cedar Waxwing
Northern Shrike
Loggerhead Shrike
*Starling
Yellow-throated Vireo
*Red-eyed Vireo
Philadelphia Vireo
*Warbling Vireo
Black-and-white Warbler
*Prothonotary Warbler
*Golden-winged Warbler
Blue-winged Warbler
Blue-winged Warbler
Tennessee Warbler
Nashville Warbler
Parula Warbler
*Yellow Warbler
Magnolia Warbler
Cape May Warbler
Black-throated Blue Warbler
Myrtle Warbler
Black-throated Green Warbler
*Cerulean Warbler
Blackburnian Warbler
Chestnut-sided Warbler
Bay-breasted Warbler
Blackpoll Warbler
Palm Warbler
*Ovenbird
*Northern Waterthrush
*Mourning Warbler
*Yellowthroat
Yellow-breasted Chat
Hooded Warbler
Wilson's Warbler
Canada Warbler

*American Redstart
*House Sparrow
*Bobolink
*Eastern Meadowlark
*Red-winged Blackbird
Orchard Oriole
*Baltimore Oriole
Rusty Blackbird
*Common Grackle
*Brown-headed Cowbird
*Scarlet Tanager
*Cardinal
*Rose-breasted Grosbeak
*Indigo Bunting
Evening Grosbeak
*Purple Finch
Pine Grosbeak
Common Redpoll
*American Goldfinch
*Rufous-sided Towhee
*Savannah Sparrow
Grasshopper Sparrow
Henslow's Sparrow
*Vesper Sparrow
Slate-colored Junco
Tree Sparrow
*Chipping Sparrow
*Field Sparrow
White-crowned Sparrow
White-throated Sparrow
Fox Sparrow
*Swamp Sparrow
*Song Sparrow
Snow Bunting

* - nests locally

Oak Orchard

A Wildlife Haven

Editor's Note: Birds on wing and beaver in the thicket enjoy freedom and tranquility in a 20,000 acre state-federal complex in western New York where three wildlife refuges — the state-owned Oak Orchard and Tonawanda and the federal Iroquois — run together. Waterfowl, pheasants, hawks, muskrat, mink, beaver, song birds, fox, raccoon, whitetail deer and many other animals delight in this habitat.

The area welcomes more than 40,000 Canada Geese who regularly stop during spring migration as they make their northward flight to Canadian breeding grounds. Thousands of visitors come for the spectacle and to relish the peaceful surroundings of the preserve.

A great deal more thought and effort than one might expect is often involved in the acquisition of such land. The following is excerpted from a story on the involved background of the area written by Don Cook, a nature lover and sportsman.

At one time approximately 25,000 acres of swampland, known by various names such as Alabama Swamp, Oak Orchard Swamp, and Tonawanda Swamp was one link in the chain of lowlands and wetlands extending across the state. Many attempts were made to drain the swamp.

The first attempt was made back in 1829, when an association of landowners spent $12,000 to enlarge the outlet of Oak Orchard Creek.

In 1855, the legislature appointed a commission to study drainage of the area. The commission estimated costs to be $20,000, which was rejected as too costly by the landowners.

In 1865, an act was passed allowing two commissioners to drain certain lowlands in the town of Barre. They were successful, and, as a result, two more acts were passed in 1867 and 1869 under which a total of 4,670 acres were drained.

In 1893, $35,000 was appropriated to improve Oak Orchard Creek which was then being used as a feeder canal.

Initially, this great swampland acted as a sponge, storing vast quantities of water for the dry periods of the year. However, in 1912, large drainage canals were completed throughout the district causing much of the swamp to dry-out seasonally. Subsequently, several serious fires raged in the muckland which burned through to the clay base.

The burned muck varied in depth from one to 15 feet and once burned its value for agricultural purposes was gone for the foreseeable future. Also, with the fast runoff, the village of Medina, whose water supply was obtained from wells four miles north of the swamp, lacked necessary water during dry summers.

Prior to the drainage the area produced a large number of the finest muskrat pelts for Hudson Seal trade and an abundance of mink. Afterwards, both of these species decreased in abundance and the waterfowl, commonly seen by the settlers in huge numbers, were not as evident.

In 1930, Martin A. Schmitt, a furrier from Buffalo, acquired about 1,500 acres of the present Oak Orchard area to raise muskrats.

With his diking operations and water level controls he succeeded in re-establishing a valuable habitat for muskrats and, in doing so, made the area once again attractive for use by waterfowl and other animals.

Schmitt, who was never trained in the techniques of engineering or surveying, used a system of low dikes to catch the spring floods. He determined water levels and locations for his dikes by driving nails into trees at water levels representing various stages of the spring floods.

After making muskrat ponds, he enclosed them with low muskrat-proof fences so that the muskrat could get neither in nor out. However, he had difficulty because the ponds dried out in the dry seasons. To overcome this, he built a revolving scoop arrangement at the edge of the Oak Orchard Creek and operated it by the use of a windmill.

This did not supply enough water at certain times so he built a low-head pump using a dismantled hot water tank and a propeller attached to a shaft through the center which was belted to a salvaged Model "A" Ford motor. This type of pump arrangement is being used today commercially for drainage and flood purposes in the muck areas.

In the late 1930's the New York State Conservation Department had accumulated a small amount of money for land acquisition. With only enough money to negotiate for one large marsh area in that region Robert F. Perry, regional director of the Conservation Department, encouraged rapid acquisition of the Schmitt property. Through the Schmitt estate the state became the new owner of a large, contiguous piece of Oak Orchard swampland for $10 an acre.

More property was later bought adjacent to the Schmitt property from Dr. L.A. Stafford, who owned land east of the Schmitt land. Today the Stafford

property is flooded over and named Goose Pond and Ox Bow Pond. Continuing to the east, the other half of Goose Pond and Ox Bow were bought from Schmitt's son and from the Western Farms Company.

Previous to the purchase by the state, the land had been drained and crops grown there on a yearly basis.

In 1947, the final 2,500 acres were acquired for the Oak Orchard Wildlife Management Area.

The original purpose of the area was to establish a resting refuge for migrating waterfowl and to provide feeding facilities for the large numbers of Canada Geese that habitually stop off in this locality for several weeks each spring. It was also anticipated that the refuge would be developed to provide increased breeding habitat for ducks indigenous to this part of the state and, possibly, for geese.

Development work, consisting of a complicated system of low diking designed primarily to catch and hold a maximum acreage of spring flood waters, was completed in 1948 and the major units were flooded for the first time in the spring of 1949.

In the next decade, additional diking was completed and at the present time, approximately 1,000 acres are permanently flooded. About 100 "pot holes" or small dugout ponds have been constructed to encourage waterfowl breeding and more than 700 acres of brushland outside the flooded areas have been cleared and cropped on a rotation basis to provide improved duck nesting habitat and favorable conditions for pheasants and other upland species.

In 1955, the 6,300 acre Tonawanda Wildlife Management Area was acquired.

The Tonawanda has approximately 1,700 acres in permanent impoundment. Of these, 800 acres are temporarily flooded paddie fields and 112 acres of pot holes and small marshes on the upland areas.

The Iroquois National Wildlife Refuge was established in 1958 for protection of the waterfowl resource of the Atlantic Flyway. It comprises 10,800 acres of marshland, swamp woodland, wet meadows, pasture and cropland. The lowland is flooded by Oak Orchard Creek during late winter and early spring.

The Iroquois Refuge has also been developed toward providing the best possible habitat for breeding and migrating waterfowl. The construction of dikes and water-control structures create large marsh and pond areas supplied by Oak Orchard Creek. Small impoundments have been made on lateral drainages. Upland acreage is managed to produce optimum nesting and feeding conditions. Most of the open land has been maintained as grassland or cropland on which food crops are produced for supplemental wildlife food.

Today the contiguous tract of 20,000 acres represents one of the top major (Atlantic) flyway resting spots for migratory waterfowl on their spring and autumn flights.

Recreational use, traditionally hunter, fisherman, trapper oriented, has vastly changed during recent years. More and more people each year, enjoy the three wildlife management areas for bird watching, nature study, photography and just getting "off the beaten path."

Mallards, black ducks, pintails and American widgeons are attracted along with the Canada Geese — particularly during the spring migration. Other waterfowl may also be observed during the spring and fall, such as the green-winged and blue-winged teal, wood duck, gadwall, shoveler, redhead, ruddy duck, blue goose and the whistling swan.

DESCRIPTION OF LAND USE
ADJACENT TO THE WATERSHED STREAMS

Cropland	Adjacent vegetation in these areas is minimal due to intensive cultivation. Species vary from native grass and herbaceous growth interspersed with willows and dogwood to narrow wooded streambelt, (0-20 feet) of northern hardwoods.
Wetlands	Where wetlands border the streams, no definite banks exist. Vegetation varies throughout the different types of wetlands. (See E-4.)
Forest Land	These areas of streambank are well established with tree and shrub species typical of the northern hardwood association. Typical species include beech, maple, oak, ash, and cherry.
Cultivated Muck	Vegetation on these uniform channel banks include native grasses, herbaceous plants and some willow and dogwood shrubs. Privet or willow hedges are established on one side at the top of the bank to reduce wind erosion.
Forested Muck	This area includes cottonwood and a mixture of hardwoods in conjunction with willow, elm, red maple, and ash. These species are well established at the channel edge.
Wooded Wetlands	A high water table in this area promotes willow, ash, elm, and red maple growth up to the channel edge. During spring flows, flooding occurs in these areas.

APPENDIX F

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION II

ROCHESTER FIELD OFFICE

O A K O R C H A R D C R E E K

S U R V E Y

Conducted for:

U.S. Department of Agriculture
Soil Conservation Service
New York State Office

1974

OAK ORCHARD CREEK SURVEY

INTRODUCTION

This survey was conducted in accordance with a signed agreement between Region II of the Environmental Protection Agency (EPA) and the New York State Office of the Soil Conservation Service (SCS). At the request of SCS, sediment samples were collected and analyzed for an array of heavy metals and pesticides as well as macroinvertebrate disposition. Stations selected by SCS were at Route 98 in the Town of Elba (Site 1) and McNamara Road in Barre Township (Site 2) as shown on Enclosure (1).

Information derived from this survey is intended to supplement existing water quality data and assist SCS in its preparation of an environmental impact statement for a proposed project in the upper watershed of Oak Orchard Creek. The prime purpose of this project is the alleviation of periodic flood damage to the muckland area north of Elba, New York.

METHODS

Samples were manually collected on June 3, 1974. Analyses for heavy metals and pesticides were made at the Regional Laboratory in Edison, New Jersey and biological examinations were made at the Rochester Field Office. Heavy metals were analyzed by atomic absorption spectrophotometry and pesticides by electron-capture gas chromatography.

RESULTS

Discussions which follow are merely intended to point out those parameters which are present in concentrations that could be harmful to the environment. When reviewing these results two important facts should be kept in mind. First, this information represents only one grab sample at two locations with no accompanying water quality data. Second, no acceptable sediment criteria exists. However, comparisons have been made utilizing as guidelines previous results obtained from surveys conducted by the Rochester Field Office of EPA.

Heavy metal analyses appear in Enclosure (2). Lead and, more especially, zinc concentrations appear substantially higher than in recent analyses of fifteen harbors conducted by this office. However, any such comparison can be useful only on a relative basis because of the above mentioned reasons. Comparison with available data from a rural stream environment, in this case Mill Brook, which is located in Chenango County, New York, shows concentrations to be generally similar with the exception of zinc which is much higher at Oak Orchard.

Enclosure (3) shows the results of pesticides analyses. The only ones found in any significant concentration belong to the dichlorodiphenyl (DD) family of insecticides. Values were substantially higher at Site 1 than at Site 2. This would seem expected since Site 1 drains a much larger portion of muckland than Site 2. DDE and DDT levels at Site 2 are comparable with the background levels found at Mill Brook. However, concentrations are higher at Site 1 than at Mill Brook which could possibly be explained by the heavier agricultural usage of the Oak Orchard watershed as well as its larger size.

Concentrations of the DD insecticides, particularly at Site 1, are many times higher than the maximum concentrations in water recommended by EPA and based upon acute toxicity values for the most sensitive species of aquatic life. However, from conversations with Pesticide Branch personnel in EPA, Region II, it was concluded that the DD levels in the sediments even at Site 1 are not unexplainably high in view of the watershed land use and the very high degree of persistence of these chemicals. More important, since EPA has banned all agricultural usage of these pesticides in the eastern states, values should steadily decrease.

As previously mentioned, no water quality samples were collected for chemical analyses during this survey. However, the biological information obtained does present, in broad terms, a fairly reliable picture of water quality through a study of the macroinvertebrate community. These data appear in Enclosure (4).

The biological investigation at both stations took place in a deep water (pool) environment. The community at Site 1 was dominated by the organic pollution tolerant aquatic earthworms. However, dominance by this group is not uncommon for a pool situation and it is, in fact, suggested by the presence of other groups such as the midges, clams, and beetles, that the bottom sediments at this site are not grossly polluted. The low density of the total macroinvertebrate population recorded was probably a result of the physical composition of the sediments which were composed primarily of fibrous material coated with soil particles - not an ideal macroinvertebrate substrate. In summary, Site 1 appears only moderately polluted.

Organic pollution tolerant organisms (aquatic earthworms and midges) also dominated the macroinvertebrate community at Site 2. The total population was substantial enough to suggest that the area had not been affected by a toxic agent and that the bottom sediments were able to support a pool macroinvertebrate community. However, the composition of this community, along with the abundant aquatic plants observed, does indicate the presence of organic waste and supports the conclusion that this area is marginally-moderately polluted (enriched).

SUMMARY

Important results of EPA's survey were the significant concentrations of zinc and lead which were found in the sediments. Biological findings tend to indicate that the macroinvertebrate population of these same sediments were not markedly affected by any toxic agents. However, the heavy metal findings do stress a need for caution during construction to minimize disturbance of these bottom sediments which might result in undesirable downstream migration towards the wildlife refuges. After completion of the proposed structural and land treatment measures the projected reduction of sediment loads should prove beneficial to the aquatic environment.

In future surveys, consideration might be given to obtaining a few representative soil samples from the project area. This would be helpful in pinning down the probable sources of the toxic substances. At Oak Orchard, it does appear that large amounts of toxic metals may be contributed by the muckland area, since the majority of concentrations for these parameters were greater at the downstream station. However, this is by no means conclusive.

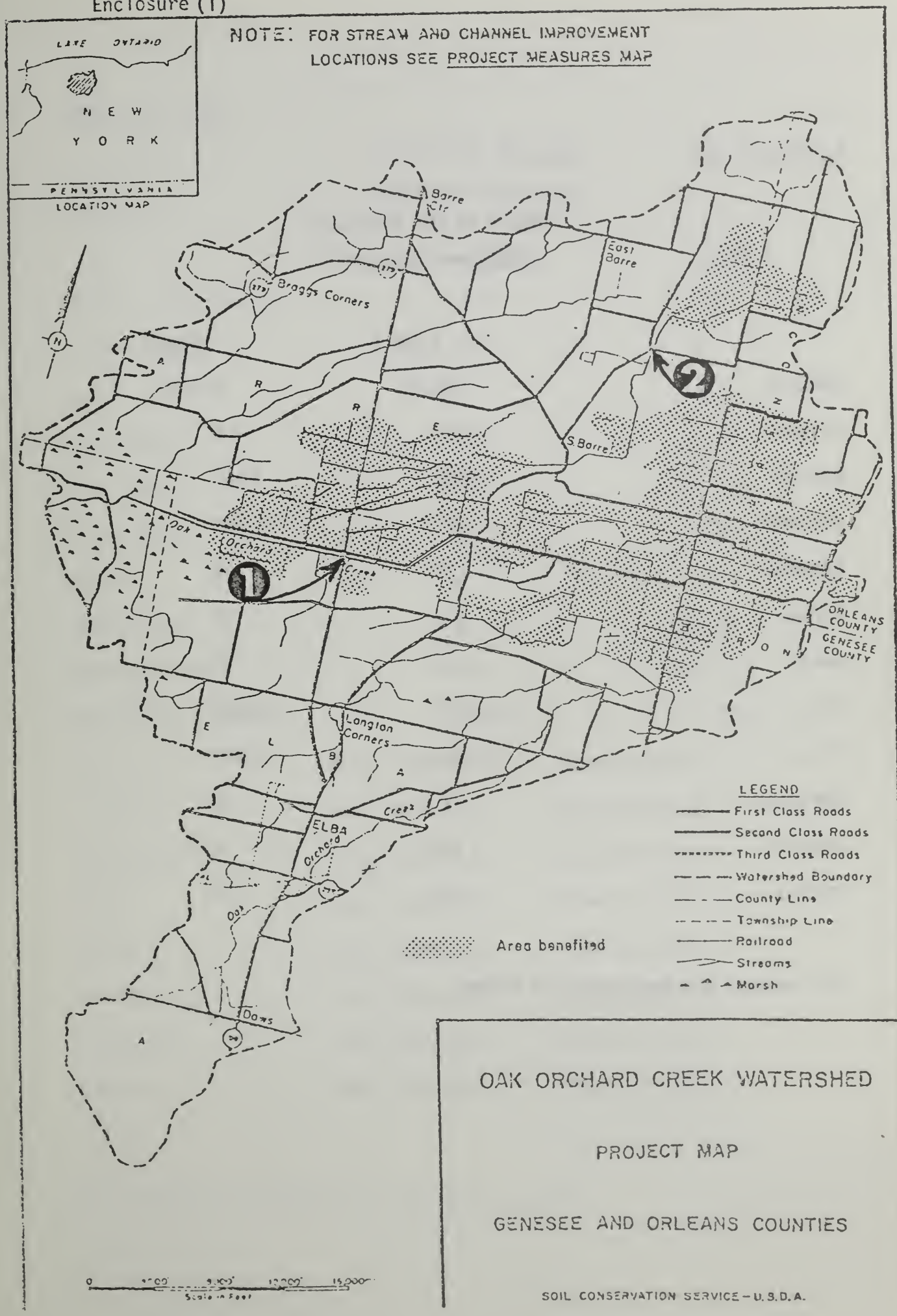
Sediment sampling in conjunction with soil samples would be useful to:

a. establish background levels,

b. pin down sources, decreasing or emphasizing the need for concern especially during construction, and

c. uncover possible benefits, when prior to the project there were traceable detrimental effects to the downstream fish and wildlife, which could be corrected by same.

Other data which could provide some useful back-up information would be an analysis of representative well water samples within the project area. This might provide the necessary input for a source determination of sediment contamination, whether from surface percolation or sub-surface groundwater.



OAK ORCHARD CREEK WATERSHED

PROJECT MAP

GENESEE AND ORLEANS COUNTIES

SOIL CONSERVATION SERVICE – U.S.D.A.

Enclosure (2)

HEAVY METAL ANALYSES
(Sediment Samples)

	Site 1	Site 2
Mercury	0.25	0.50
Silver	< 6	< 6
Barium	< 420	< 420
Aluminum	4,100	7,400
Cadmium	7	20
Copper	42	24
Lead	93	79
Zinc	1,000	5,000
Iron	13,000	9,800
Chromium	11	15
Arsenic	14	8.3
Nickel	30	23

All values are expressed in mg/kg.

PESTICIDE ANALYSES
(Sediment Samples)

	Site 1	Site 2
Alpha - Chlordane	5.5	1.2
p,p' - DDE	59.7	9.3
p,p' - DDT	349	12.5
o,p - DDT	40	< .04
p,p - DDD	115	< .035
o,p - DDD	31	5.2
Aldrin	< .01	.40
Heptachlor	< .01	< .01
Methoxychlor	< 2.4	< 2.4
Heptachlor, Epoxide	< .015	< .015
Dieldrin	None detected	None detected
Lindane	None detected	None detected
Toxaphene	None detected	None detected
2,4-D	None detected	None detected
2,4,5-T	None detected	None detected
Parathion	None detected	None detected
Malathion	None detected	None detected
Endrin	None detected	None detected

All values are expressed as ug/kg dry weight.

MACROINVERTEBRATE DATA (ORGANISMS/SQUARE METER)

	Site 1	Site 2
Station	Rte. 98	McNamara Rd.
Lab No.	0764	0765
Depth of Sample (ft.)	4	1.5
Annelida		
Hirudinea (leeches)		
Helobdella stagnalis		151
Oligochaeta (aquatic earthworms)		
Tubificidae		
Limnodrilus cervix typical	43	
Limnodrilus claparadeanus		43
Limnodrilus hoffmeisteri	22	734
Peloscolex ferox	65	
Unidentified immature worms with capilliform setae	22	238
Unidentified immature worms without capilliform setae	86	346
Arthropoda		
Insecta		
Coleoptera (beetles)		
Elmidae		
Dubiraphia sp.	43	389
Unidentified adults	11	16
Diptera		
Ceratopogonidae (biting Midges)		
Unidentified larvae	11	
Empididae (dance flies)		
Unidentified larvae		5
Simuliidae (black flies)		
Simulium sp.	11	16
Tabanidae (horseflies)		
Chrysops sp.		59
Tendipedidae (midges)		
Chironomus (Chironomus)sp.	11	
Cricotopus sp.		713
Polypedilum flavus	32	
Pheotanytarsus sp.		108
Unidentified pupae	11	32
Tipulidae (crane flies)		
Pilaria sp.		32
Unidentified larvae		22
Unidentified pupae		59
Mollusca		
Pelecypoda		
Sphaeriidae (fingernail clams)		
Pisidium sp.	11	11

Total Organisms/sq. meter	379	2974
Substrate Description	Fibrous material coated with soil particles, twigs, dead clams & snails	Leaf litter, dead clams and snails, abundant rooted aquatic plants

APPENDIX G

Archaeological Survey Within the Proposed

Oak Orchard Watershed Project

Pandora E. Snethkamp
Sydne B. Marshall
State University of New York
at Buffalo
June 25, 1974

Submitted in fulfillment of the contract between the New York Archaeological Council and the Department of Agriculture.

CONTENTS

I. Introduction and Statement of Purpose

The Oak Orchard Watershed Archaeological Survey, financed by the Department of Agriculture, Soil Conservation Division, was conducted in preparation of the Environmental Impact Statement being prepared for the Oak Orchard Watershed Project, Public Law 566. Continuing efforts by the New York State Archaeological Council to encourage and promote professional examination of prehistoric and historic remains threatened by inundation has made this survey possible.

In May 1974, monies were appropriated by the Department of Agriculture for an archaeological survey of the Oak Orchard Watershed Project area. During the last two weeks of May 1974, a crew of three to four individuals, experienced in archaeological survey methods in western New York, surveyed portions of the Elba Muck and surrounding environs. The purpose was to determine what impact the proposed Oak Orchard Watershed Project would have on the archaeological remains in the area.

Continuing cooperation between developers and professional archaeologists is necessary to insure adequate surveys of proposed project areas and to interpret any findings based on the culture history of the northeastern United States.

In this report a summary of the findings of the survey will be offered as well as recommendations for further work. Implications of the survey

for the interpretive framework of the prehistory of the Oak Orchard Watershed area will also be discussed. Also included is a section on the methodology used during the actual survey.

The authors would like to thank Mr. Bill Ellis, Senior Staff Geologist, Syracuse and Mr. Bill Surrey, Batavia, of the Soil Conservation Department of the Department of Agriculture for providing maps and other valuable information concerning the project area. Mr. John Mortellaro graciously provided his time to show the senior author many of the roads leading around the Muck, as well as explaining in great detail the history of the Muck. Mr. Peglow was kind enough to permit us access to his land and was able to inform us of a site location bordering the Manning Muck. Thanks are due to the numerous land owners who granted us access to their land. We would also like to thank Dr. Marian E. White, President of the New York Archaeological Council and professor of Anthropology at SUNY Buffalo. The State University of New York at Buffalo was used as the project headquarters and provided the survey team access to a four-wheel drive field vehicle, lab space and equipment. In addition, our appreciation is extended to other members of the crew, David Noll, Gail McGloin and Sharon Wirt. Dr. Marian E. White, Mr. Neal Trubowitz, and Mr. Russell G. Handsman all offered valuable suggestions and help during the preparation of this report. We would especially like to thank the Department of Agriculture, Soil Conservation Department for granting funds in support of this project.

II. Survey Methodology and Prior Research

The project area to be surveyed by the SUNY crew was defined by maps of the Oak Orchard Watershed Project, provided by the Soil Conservation Department. In addition, portions of the surrounding knolls and hills adjacent to the channels that were to be affected by the project were surveyed. The channel network affected by the project amounted to approximately eighty linear miles of channels, or a total universe of one hundred sixty linear survey miles,if both sides of the channels are considered. Of this, approximately twenty-five miles (fourteen percent) of land adjacent to the channels as well as one hundred seventy-five acres of land immediately adjacent to the Muck was surveyed. The small percentage of area covered by the survey was due to a number of factors. First, the agreement called for twenty-one days of field work by a two man crew for a total of fourty-two man days. Due to time limitations and the availability of experienced personel during June, a crew of three to four individuals worked for a total of thirty man days in the field, (FIGURE 16 indicates the breakdown of man days and costs) during the last two weeks in May. Second, dense vegetation cover, surrounding the periphery of the muck, adjacent to channels affected by the project, precluded any extensive survey of these areas. Heavy vegetation cover adjacent to the tributary of the Oak Orchard Creek that drains the Manning Muck was not surveyed, as well as the area west of Quaker Hill Road. The channels affected by the project that were located east of Transit Road in the Elba Muck,

were intensively surveyed by the SUNY crew during the first three days of the survey.

While the figure of ten to twenty percent may seem low to non-archaeological observers, most of the areal surveys suggest equatable samples. Winters' (1967:12) recent statement on similar problems in the Wabash Valley of Illinois is appropriate:

> Rarely can an adequate survey of an area be completed within a single year. We estimate that 90 percent of likely locations noted in the present survey could not be examined because of heavy pasture cover, wheat stubble, weeds, or flooding of the lowlands. Thus, we suggest that a survey in any given area of the midwest should cover a three year period, by which time about 30 percent of possible site locations should have become available.

Since most surveys are not viewed as lengthy research projects, but as short term requirements, funded late within the proposed development schemes, adequate samples can never be drawn from the research area. But, based on the area sampled by the survey crew, statements can be made concerning the impact of the project on the archaeological remains affected by the project. Even though fourteen sites were located during the survey, only gross statements concerning the prehistoric occupation of the area can be made because of the lack of diagnostic material found.

The Oak Orchard Watershed Survey posed unique problems in combining systematized survey as well as choosing an adequate sample in order to predict the effect that the project would have on the archaeological resources of the area. In the case of the Oak Orchard Watershed Survey it was necessary to survey areas directly adjacent to the project area in order to confirm the existence of archaeological sites in the area and their relationship to the project area.

The survey strategy can be divided into three major phases.

A. The first three field days were spent surveying the areas directly adjacent (zero to twenty-five feet) to channels that would be affected by the project. The first day included checking the channel profiles every one thousand feet for evidence of any buried occupations. During this period one stray Meadowood point base (Muck, UB 1279) was located within fifteen feet of a channel.

B. We then chose to test the following hypothesis. Based on the USGS fifteen minute, 1897 series, quadrangle map (Albion, N.Y., FIGURE 5).. area that we had surveyed during the three previous three days was originally part of the Oak Orchard Swamp. If the 1897 series map was indicative of the topography as it existed prehistorically, we would expect to find evidence of aboriginal occupation on the knolls and surrounding slopes of the Elba and Manning Mucks. Three of the knolls that existed on the 1897 series map were checked for evidence of aboriginal occupation during the next three days. A total of six sites were located on the three knolls that were checked. All of the areas surveyed were within one thousand feet of a channel and corresponded to an elevation line on the USGS topographic maps of greater than three hundred and thirty-five feet. The sites range from flake scatter areas to flake and tool concentration areas, representing limited activity and specialized activity sites, i.e. seasonal procurement. The surface collections from these sites did not include any diagnostic artifacts, i.e. projectile points, that would have allowed us to state the cultural affiliation of the site. These sites would require periodic resurfacing over a period of several years to obtain a diagnostic artifact.

C. The last three days were spent checking various plowed flields on the slopes adjacent to the channels on the periphery of the Elba Muck. This included at least two plowed fields on the north, east and south sides. Plowed fields were chosen on both the knoll and slopes because they represent the optimal conditions under which archaeological sites can be located. The one hundred and seventy-five acres surveyed on the knolls and slopes were done in the flollowing manner. The crew members lined up approximately twenty to thirty feet apart and walked a transect across the field. The process was repeated until the entire field was surveyed. If any artifacts were located the area was intensively surveyed to define the limits of the site and surface collect it. During this period six sites were located on the slopes. These were primarily flake scatter and flake concentration areas.

The Department of Agriculture should not conclude that the site distribution maps (FIGURES 1-4) represent all evidence that exists for prehistoric activities within the project area. The discovery of fourteen new sites, previously unrecorded, suggests the exploitation of the area by aboriginal populations whose settlement systems involved seasonal occupation by relatively small aggregates. The sites yield evidence of limited activity and special procurement areas (FIGURE 7). In the Oak Orchard swamp the wide variety of migratory birds, waterfowl, as well as fish and land animal resources were likely the focus of procurement activities and thus the prime attraction for occupation of the area. Such knowledge should be taken into account when future construction activities are initiated, with qualified personnel being informed at each stage of the construction process. This is especially true in the case of the construction of the dam, south of Watson Road, which

was brought to the attention of the survey crew too late for examination at this time. It is through continual communication between the project planners and the professional archaeologist that maximal, intelligent use of cultural resources is possible.

The use of historical records is often a good supplement to any habitat-restricted archaeological survey. However, in the case of the Oak Orchard Watershed project area, the use of historical records and local collections proved of little value. There are three major historical references to archaeological sites published in the mid-nineteenth and early twentieth centuries. These include Squier (1849), Beauchamp (1900), and Parker (1922). In the case of the area surrounding the Oak Orchard Watershed area, these references do not indicate the presence of aboriginal sites (FIGURE 6). This is not surprizing when one considers the nature of the occupation sites found during the survey. The lack of diagnostic artifacts may have contributed to their having been overlooked by these early archaeologists. Commonly cited for the area are large Iroquois villages, such as Oakfield and Shelby fort, located five to ten miles west of the project area, mounds and burial sites. These references do not usually include small Archaic campsites such as those located during the survey. Most of the local farmers were unaware of occupation sites on their land and were dubious as to their existence. Only one small private collection belonging to Mr. Peglow of Angevine Road confirmed the presence of Archaic-related sites south of the Manning Muck. Some of the muck farmers reported that they had found occasional stray points on the muck, but never any concentration.

In retrospect, it would have been more beneficial to the project if artifacts from the limited activity areas and procurement stations

had been systematically collected using some type of control grid (Redman and Watson 1970). By doing so, any possible loss of distributional data would have been avoided. The major reason for not implementing such a field strategy was the lack of time and manpower. In all cases, a sample was collected randomly from the sites. It may be possible that subsurface settlement patterns exist. Controlled surface collections are essential to the understanding of intrasite settlement patterns. Contracts must be written to take these into account.

III. Site Descriptions and Interpretations

A total of fourteen sites has been recorded by the SUNY Buffalo archaeological survey. Occupation seems to have been focused on areas of at least 635 feet above sea level, based on recent USGS topographic maps. Six of the sites are located on glacial knolls appearing today as highland areas surrounded by muck. Seven sites are located on upland slopes peripheral to the swamp. One site is located on the muck land perse. FIGURE 7 indicates the approximate distance of each site from the nearest channel as well as its proximity to the muck.

While diagnostic artifacts are not prevalent, occupation is substantiated by the presence of some core and flake tools, unifacial tools and lithic debitage, i.e. waste flakes indicative of various stages of lithic tool manufacture activities. The prehistoric cultural material was manufactured from local Onondaga flint. While glacially deposited nodules of the Onondaga flint material are not present in the surveyed area, a large quarry site known in the vicinity of Indian Falls may well have served as the source for materials used in the Oak Orchard Swamp.

The collections indicate brief occupations by small groups of people probably exploiting the land mammal, waterfowl and aquatic resources of the then swamp environment. It is speculated that these occupations were seasonal, specialized sites, representing one of a series which together make up the complete seasonal round of transhumant populations.

Due to the absence of diagnostic artifacts, it is not presently possible to state specific cultural associations for these sites. The

lack of pottery in the collections indicate that these could represent Archaic-related sites, i.e. preceramic cultural manifestations of peoples following a hunting and gathering subsistence pattern.

Intra-site relationships are difficult to define at this early stage in analysis. However, on the basis of the surface collections, it is possible to distinguish relative differences in the densities and variability of cultural material found at each site. It is this evidence which serves as an indicator of three types of sites which categorize the Oak Orchard archaeological finds. The fourteen sites fall into the very preliminary categories; 1."flake scatter area", widely dispersed scatter of cultural material within the area of a plowed field, or unit being surveyed; 2. "flake concentration area", denser distribution of flakes and cultural material within a relatively discrete area; 3. "flake and tool concentration", a relatively dense distribution of flakes with the presence of bifaces, cores and possible tools within a relatively discrete area. The one exception is the Muck site, represented by a single projectile point fragment, here considered to be a stray artifact in an area previously inundated by water in the previously swamp environment.

Descriptions of the sites and collections follow. These sites have been recorded on U.S.G.S. 7½ minute topographic maps in the Department of Anthropology, SUNY Buffalo and have been reported in the University of Buffalo site files. In addition, they will be incorporated into the New York Archaeological Council centralized site inventory system currently being developed for New York State.

Hutcher site UB # 1289 (FIGURE 3)

Located 3/10 mile south of New Guinea Road and about ½ mile east of

Route 237 is the Butcher site, a "flake scatter area". This plowed and cultivated field (FIGURE 8) yielded a light scatter of material over an approximately ¼ acre area. The eastern limits of the site were not determined due to forest cover. Nine flakes and one block comprise the evidence of light lithic tool manufacturing activity. Upon examination in the labratory, it was found that the flakes resulted from both hard hammer and soft hammer techniques. They could be catergorized as predominantly bifacial thinning flakes with one decortication flake present.

Dash I site UB # 1285 (FIGURE 2)

This site was located in a formerly cultivated field presently covered by heavy grass. Collection from this field led to categorization of the site as a "flake scatter area". The relatively light concentration discovered occurred in an overgrown area and thus may not be representative of the density of occupation at Dash I. One tabular Onondaga flint chunk which appears to have been utilized and four Onondaga flakes comprise the evidence for lithic manufacturing debris in the area. The site, approximately ¼ acre in extent, is located on the edge of a knoll, surrounded by the present muckland, formerly swamp territory. One thousand feet to the west of Dash I, in the same field, are two other occupation zones, called here Dash II and Dash III. The field location of the Dash sites is approximately 1¼ miles east of Oak Orchard Road and 500-700 feet south of Scheelar Road.

Dash II site UB # 1286 (FIGURE 2)

Located one thousand feet west of Dash I and five hundred feet east of Dash III in a cultivated area, Dash II was represented by a relatively heavy concentration of flakes with the presence of a few blocks over an area of approx. 140' x 100'. In total, forty-one retouch flakes less than two centimeters in diameter, thirty eight flakes greater than two centimeters,

seven decortication flakes, seven blocks and four biface fragments were collected. Time did not permit implementation of 'controlled surface collection techniques' so that while the material seems to the authors to be representative of the variability of cultural material at the site, the collection is not truly representative of the density. Dash II is considered a "flake and tool concentration area".

Dash III site UB # 1287 (FIGURE 2)

Located to the west of Dash I and southwest of Dash II, this site is also located in a cultivated area of the field. It is represented by a low concentration of flakes, seventeen larger than two centimeters and seventeen smaller than two centimeters, all representing a number of different stages in the process of lithic tool manufacture. The "flake concentration area" may have been a workshop area. The site extends within an approximate area of 100' x 60'. Unfortunately, it is not possible to determine the inter-relationships between the three Dash sites on the basis of these collections alone.

W. J. Davis site UB # 1283 (FIGURE I)

The W. J. Davis site is located 3/4 mile south of Gillette Road and about four hundred feet west of Drake Island Road in a formerly cultivated field. A total of fourteen retouch flakes less than two centimeters and eleven flakes greater than two centimeters were collected. A shovel test made in the peripheral treeline area to the south yielded one hard hammer, bifacial thinning flake and one distal flake fragment. This "flake concentration area" extended about 150' from east to west, with the north to south extension not so well defined. To the northwest of the flake scatter, a block from which flakes had been removed was found (FIGURE 9).

Delano-Steele site UB # 1292 (FIGURE 2)

The Delano-Steele site is a "flake scatter area" represented by three flakes across one half acre of cultivated field located about one mile east of Quaker Hill Road and about two thousand feet south of Delano-Steele Road.

Cavenda site UB # 1284 (FIGURE 1)

The Cavenda site is located in a garden just south of the Orleans - Genesee County line, about two hundred feet east of Drake Island Road. The two small bifacial thinning flakes collected, serve to categorize this site as a "flake scatter area". The W. J. Davis site lies to the south.

Markey I site UB # 1281 (FIGURE 2)

The Markey I site is a "flake and tool concentration area" located just south of the Orleans-Genesee County line, about two thousand feet east of Quaker Hill Road, in a presently cultivated field. The collection is relatively large and demonstrates a high degree of variability in flake types (FIGURE 13). Of note in the collection is the presence of six unifacial tools, two biface fragments, a possible netsinker, a utilized core and several blocks. Among seventy-one flakes collected, approximately seventeen show evidence of utilization. It may be speculated that this was a procurement station where activities in addition to tool manufacture took place. Markey I is located approximately one thousand feet east of the Markey II site, in the same cultivated field. The Markey I concentration extended within an area of 100' x 200'.

Markey II site UB # 1282 (FIGURE 2)

This site is also a "flake and tool concentration area" in the same

field as Markey I. About fourteen flakes exhibiting a range of flaking techniques were collected. In addition, three core tools, one unifacially retouched biface and one tabular block were collected (FIGURE 14). The limits of this concentration have been approximately delineated as 135' x 400'. The collection reflects the variability of artifacts and not the existing density. It was felt by the authors that controlled surface collection of the field at a future time would be a more informative exercise than merely collecting all artifacts in sight.

Muck site UB # 1279 (FIGURE 3)

The Muck site is represented by the find of one projectile point fragment recognized as a Meadowood point fragment, diagnostic of the Early Woodland period (FIGURE 12).

> This is the characteristic point type of the early Point Peninsula complex, radiocarbon dated between about 2448 B.C. and 563 B.C. (Ritchie 1961: 35).

Located about 3/4 mile south of Browns Schoolhouse Road and about 3½ miles east of Transit Road, this stray find was found on the surface of the shallow muck soil, formerly the Oak Orchard Swamp. It is speculated that this projectile fragment is indicative of procurement activities, probably hunting, in the swampland. The Muck site is the only "stray find area" located during the survey (FIGURE 10).

Oak Orchard site UB # 1280 (FIGURE 4)

The Oak Orchard site is a " flake scatter area" located in a presently cultivated field of about 1½ acres (FIGURE 11). The site is about 4500 feet north of Watson Road and about three hundred feet east of Oak Orchard Road on a highland rise within the 640 foot contour. Light flake scatters occurred in two areas of the field. Two flakes were found Southeast of the

house located on Oak Orchard Road and one flake, one scraper and two late nineteenth century sherds were found south of the house.

Peglow site UB # 1288 (FIGURE 3)

Illustrated in FIGURE 15 is the Peglow collection, a group of artifacts kindly shown to us by a private collector from the Oak Orchard area. One of the points in the collection was found in the vicinity of a fifty acre field about ½ mile north of Brown Road, just east of Transit Road at the junction with Mansfield Road. The field was not surveyed by the SUNY crew because of crop cover. For the purposes of this preliminary archaeological survey of the area, this collection confirms the presence of prehistoric occupation in the Manning Muck.

Watson I site UB # 1290 (FIGURE 4)

Watson I site is a "flake scatter area" distinguished by two flakes found within a ½ acre area in a presently cultivated field. Twelve historic European sherds, one kaolin pipe fragment and one mason bottle fragment dated 1867 found together in the western area of the field suggest the presence of a late nineteenth century garbage dump (FIGURE 12). Watson I is located about ¼ mile east of Arnold Road and about 1500 feet north of Watson Road.

Watson II site UB # 1291 (FIGURE 4)

The Watson II site is also a "flake scatter area" but is characterized only by prehistoric cultural material. Six flakes of Onondaga flint comprise the entire collection. Found within a ½ acre area, Watson II is located about ½ mile west of Arnold Road and about 1,000 feet north of Watson Road.

Collections from the fourteen sites located by the archaeological survey reflect a range of lithic manufacturing processes. Speculated interrelationships between sites must be made based on the flaking debris charcteristics of the collections. Of particular interest are the apparent relationships that exist among the Markey sites and among the Dash sites. The Markey sites, located only 1,000 feet apart, yield similar artifact assemblage inventories. Particularily distinctive is the presence of core tools and unifacial tools (only worked on one side). These two sites are the only sites located during the survey that have large decortication flakes in addition to the hard and soft hammer flakes representing bifacial thinning and retouch activities. The material collected from the Dash sites as well as stray flakes located across the Dash field are similar to each other but distinctive from the Markey collections. The bifacial tool fragments collected from the Dash II site have much finer retouch and bifacial thinning characteristics than the biface from Markey I. Core tools and large decortication flakes such as those found at the Markey sites are not found at the Dash sites. The Dash site assemblages consisted primarily of bifacial thinning and retouch flakes. This brings to attention an interesting aspect of the prehistory of the former Oak Orchard swamp. While sites on the individual knolls are most similar to those on the same knoll, totally different assemblages exist within two miles distance, in other occupation areas. It is necessary to check other knolls in the Oak Orchard swamp to further test the strength of this observation. At the time of this initial survey, this was not possible due to the obliteration of the ground surface in many areas by heavy vegetative ground cover.

It should be noted that there were no "flake and tool concentration areas" discovered on the slopes whereas sites of all categorizations were found in the uplands. Of possible exception is material from the Peglow collection since exact provenance is unknown for most of the artifacts.

The sites located during the Oak Orchard survey confirm the exploitation of the swamplands by prehistoric peoples. In the perspective of New York State archaeology, these sites contribute to the knowledge of the nature of periodic, limited activity sites within a seasonally rich resource area.

IV. Environmental Impact of the Oak Orchard Watershed Project on the Archaeological Resources of the Area

The widening and redigging of the existing channels will probably not have any impact on the archaeological resources of the Oak Orchard Watershed Project. It is possible that stray points exist along the edge of the channels, such as the Muck site, that would be potentially destroyed. Survey of the entire muck along the channels, in search of stray finds that may exist within 15-20' of the channels was impossible and impractical. Difficulties arose where many of the channels on the periphary of the Muck and at the western end were heavily overgrown on one or both sides. The manpower involved in this survey did not permit this type of intensive survey. The heavy grass cover would have required additional time in the field for adequate testing through the use of 1' x 1' shovel tests and the taking of core samples.

All of the sites located during the survey were found within 200-1000' of the nearest existing channel. Based on our understanding of the project these sites will not be endangered. It is necessary to point out that the proposed dam site for flood water control, to be built to the south of the muck came to the attention of the survey crew too late in the survey to be examined for possible site locations. It is highly probable that sites do exist in this area.

It would be advisable to have qualified personnel check the upland area(s) where fill dirt will be taken for use in the lower portions of the main channel. Given the existence of large sites located along Oak Orchard Creek north of the Oak Orchard Swamp and in the uplands along streams, it

is possible that a site may be disturbed when fill dirt is obtained. Continual contact with professional archaeologists throughout various construction stages of the Watershed Project will minimize endangerment to archaeological remains.

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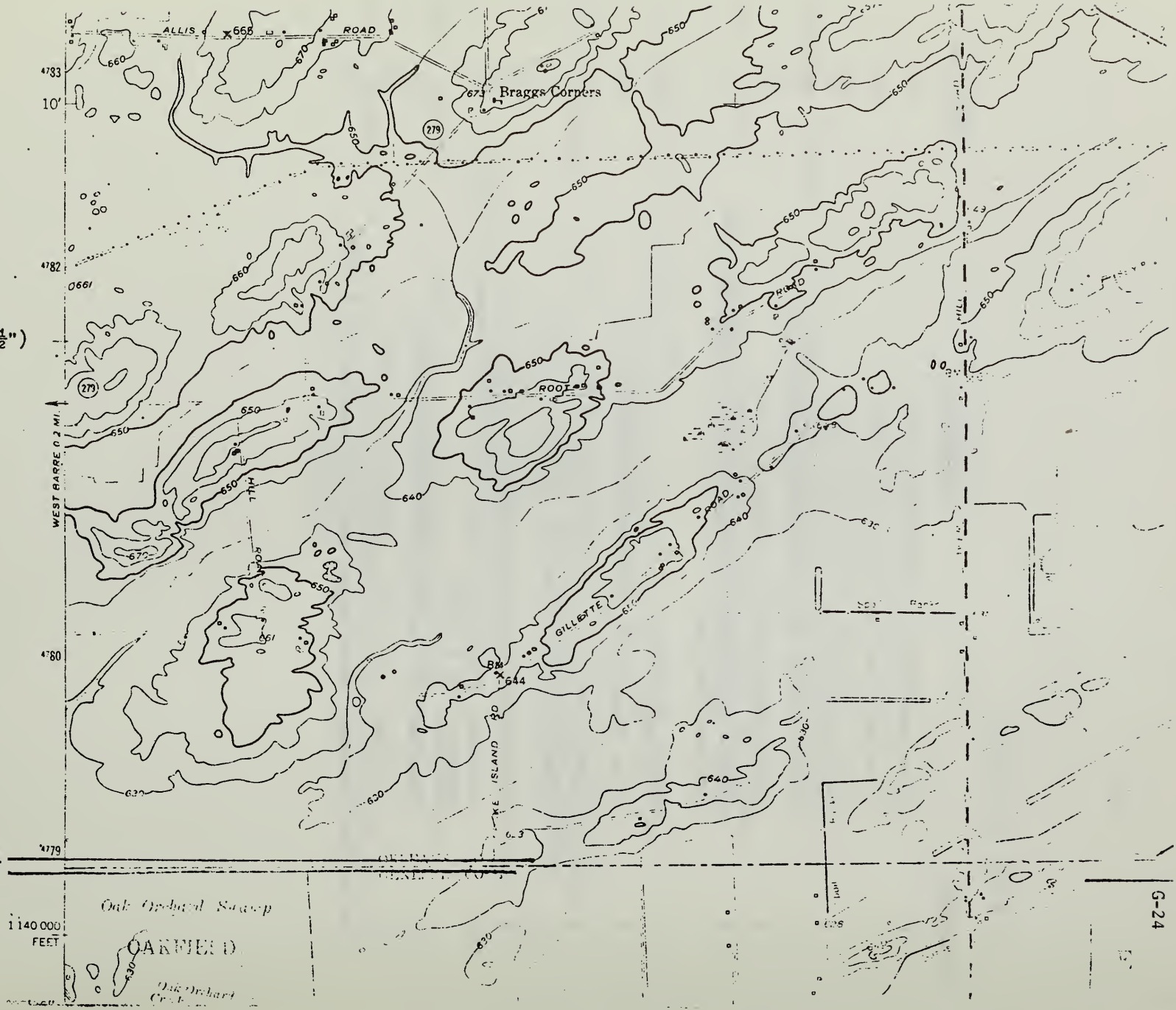
V. INDEX OF FIGURES

FIGURE 1
(SW¼ Albion 7½")



UB 1283
W.J. Davis
UB 1284
Gavenda

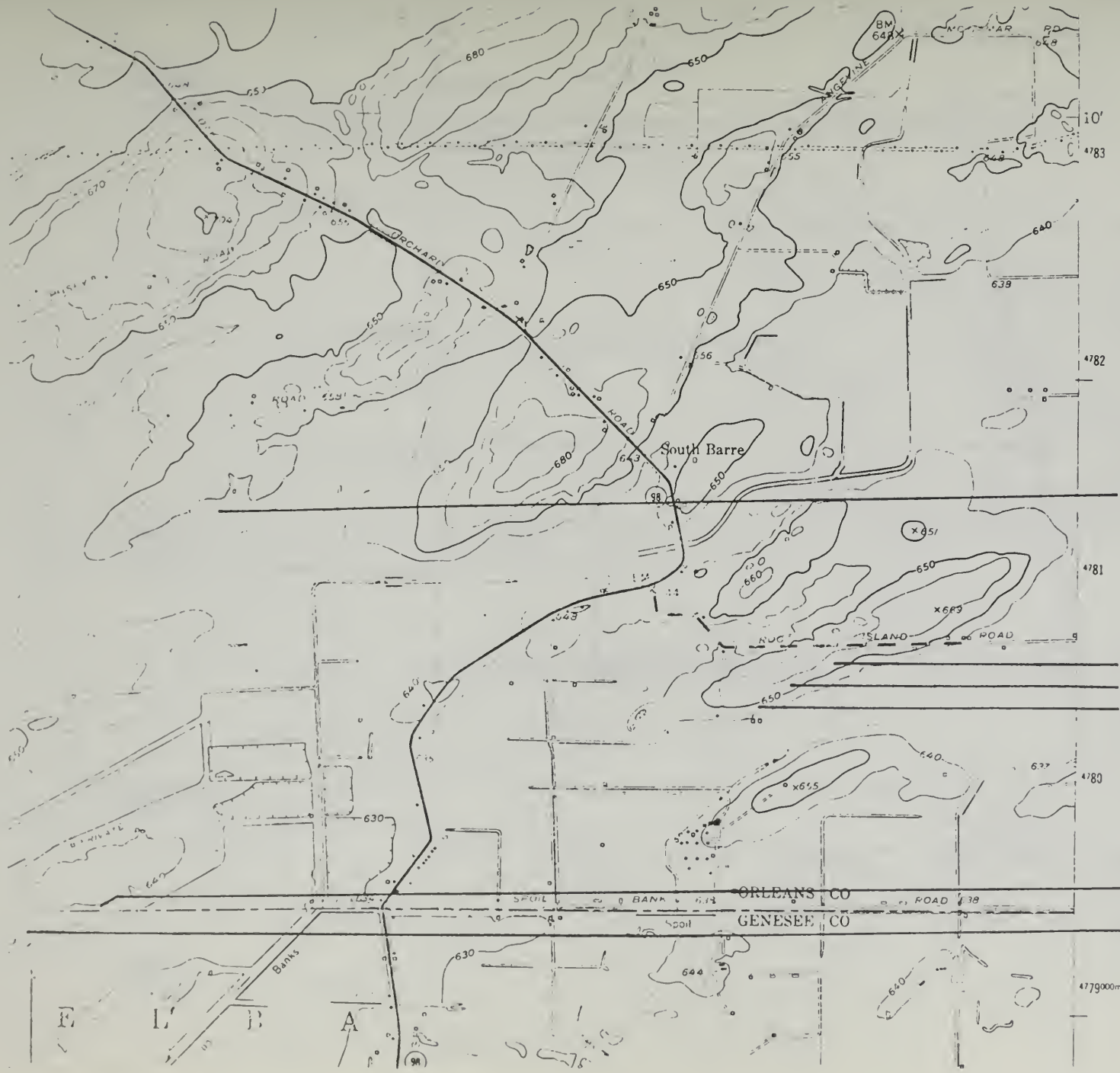


FIGURE 2
(SE¼ Albion 7½")

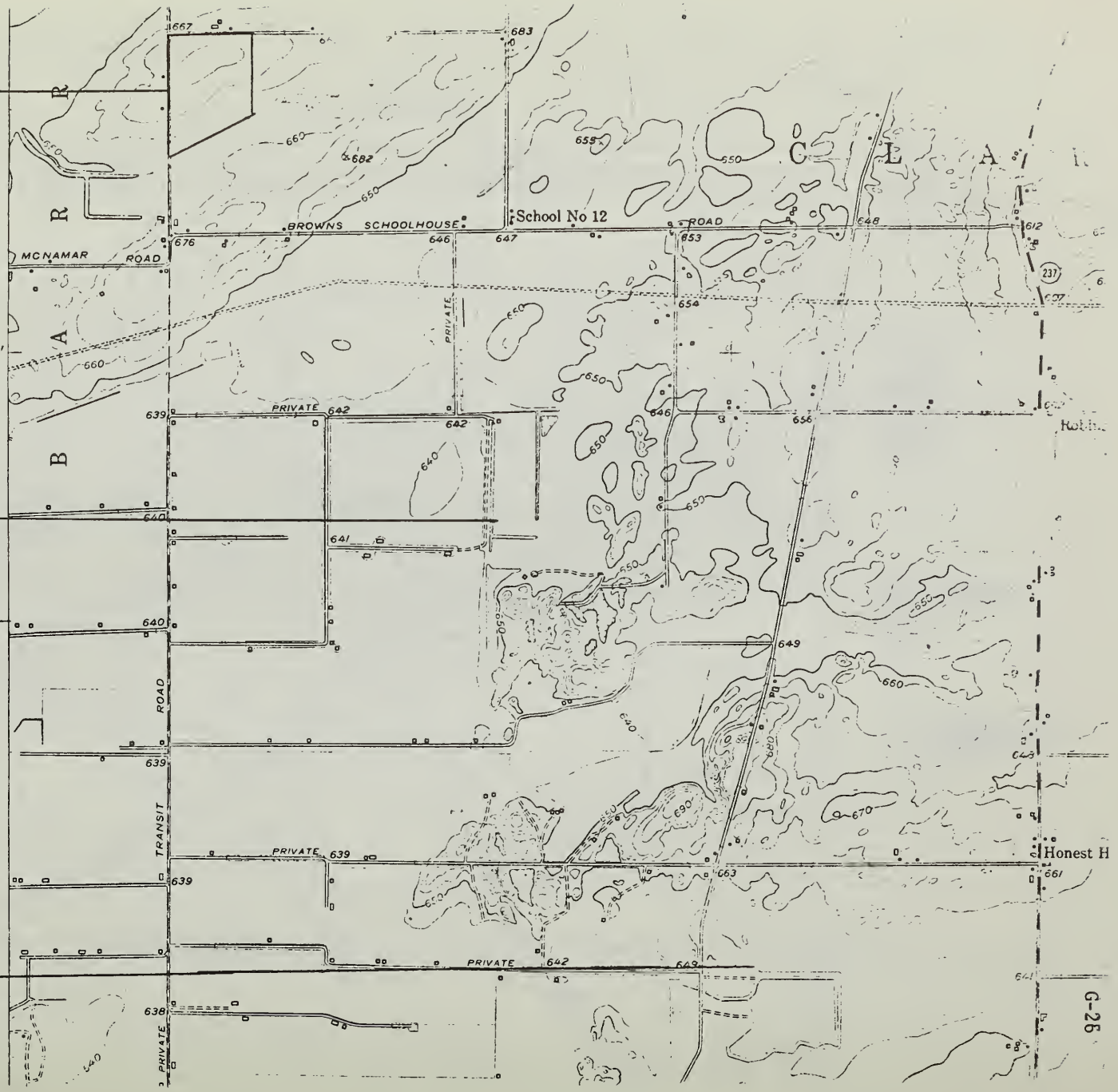


FIGURE 3
(SW¼ Holley 7½")

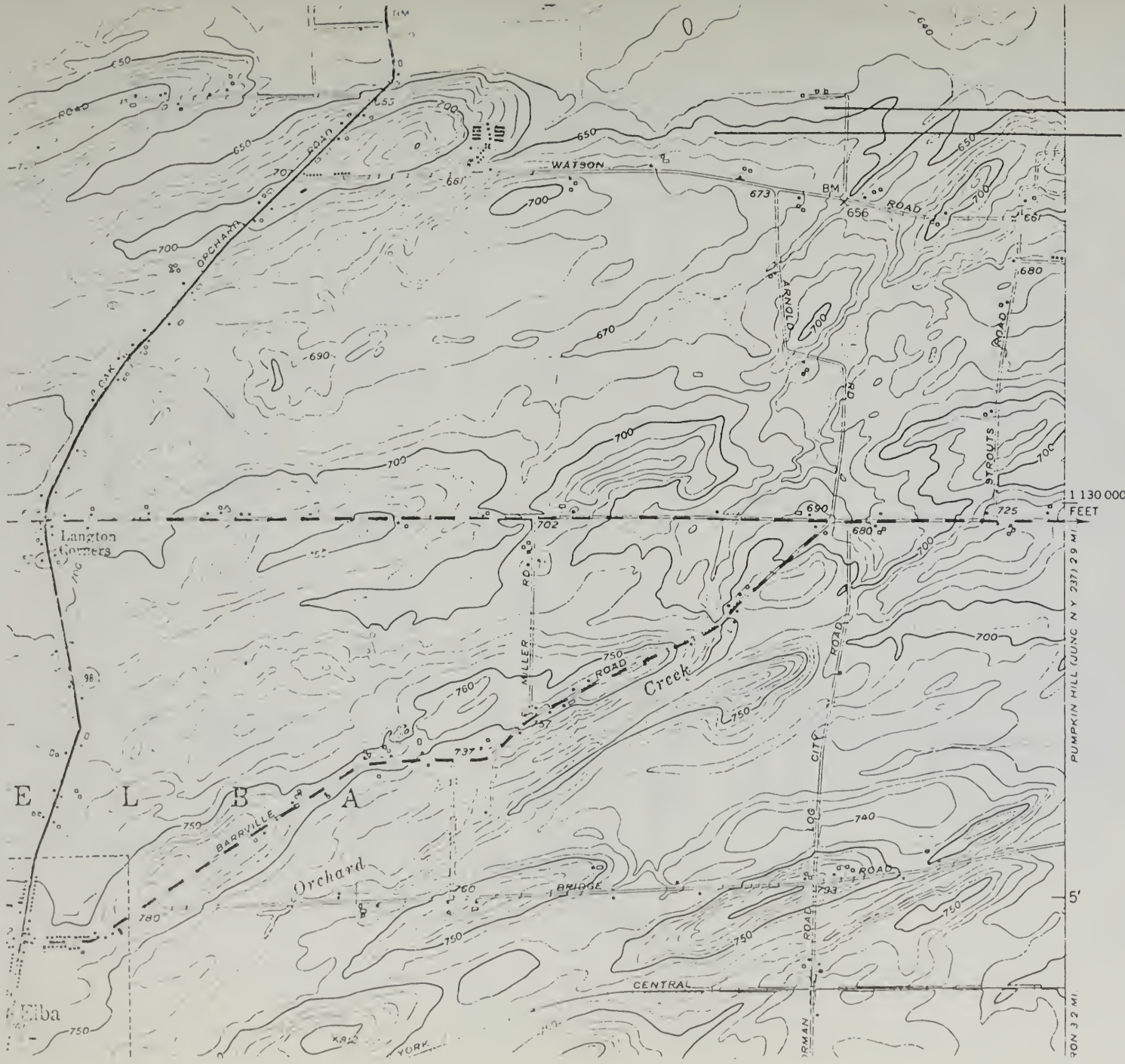


FIGURE 4
(NE¼ Batavia
North 7½")

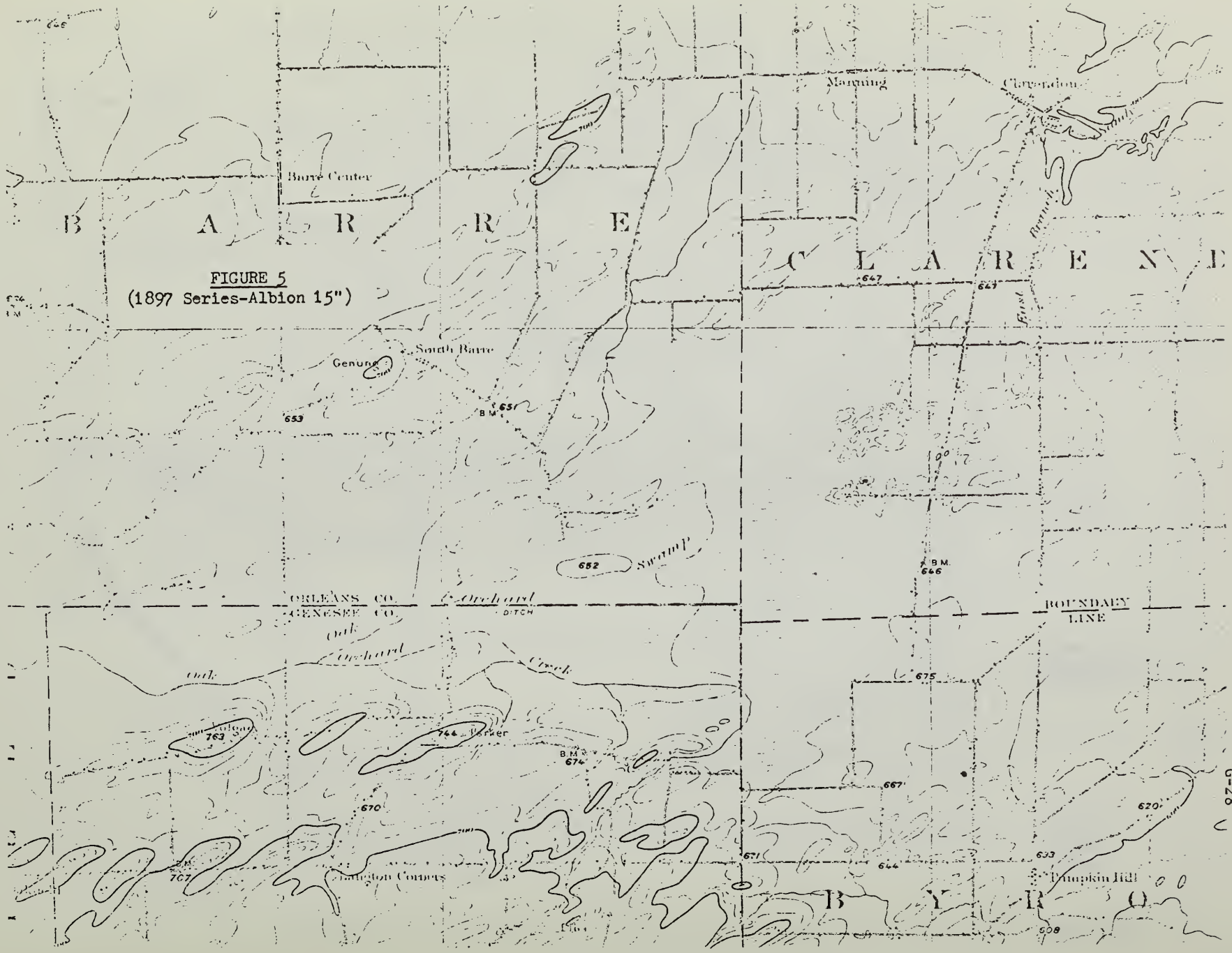
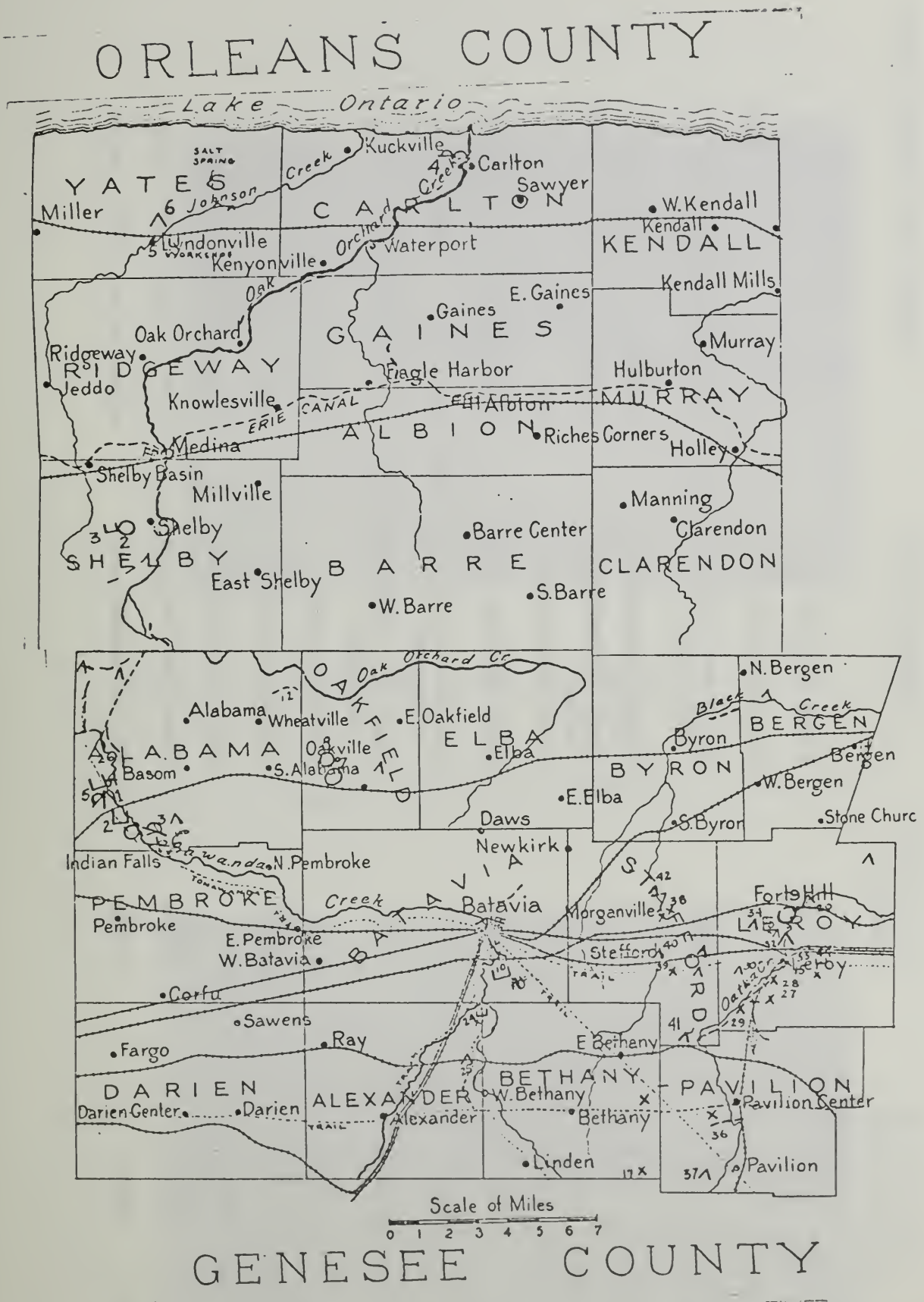


FIGURE 5
(1897 Series-Albion 15")



Parker's Plates of Aboriginal Sites in Genesee and Orleans Counties

Numbers Represent Site Locations

FIGURE 6

FIGURE 7

Site	University of Buffalo Number	Topographic Location	Nature of Site	Distance from Nearest Channel
Butcher	1289	Slope	Flake Scatter Area	Approximately 350' West
Dash I	1285	Knoll	Flake Scatter Area	Approximately 1000' North
Dash II	1286	Knoll	Flake and Tool Concentration Area	Approximately 500' North
Dash III	1287	Knoll	Flake Concentration Area	Approximately 500' North
W. J. Davis	1283	Slope	Flake Concentration Area	Approximately 1200' South
Delano-Steele	1292	Slope	Flake Scatter Area	Approximately 375' North
Gavenda	1284	Slope	Flake Scatter Area	Approximately 1100' South
Markey I	1281	Knoll	Flake and Tool Concentration Area	Approximately 300' North
Markey II	1282	Knoll	Flake and Tool Concentration Area	Approximately 350' North
Muck	1279	Muck	Stray Find Area	Approximately 15' East
Oak Orchard	1280	Knoll	Flake Scatter Area	Approximately 50' North
Peglow	1288		Private Collection	Within 200-500' distance
Watson I	1290	Slope	Flake Scatter Area	Approximately 250' South
Watson II	1291	Slope	Flake Scatter Area	Approximately 400' South

FIGURE 8: Butcher site UB # 1289, Looking NE.

FIGURE 9: W.J. Davis site UB # 1283, Looking S.

FIGURE 10: Muck site UB # 1279, Looking N. Shovel indicates find location.

FIGURE 11: Oak Orchard site UB # 1280, Looking E.

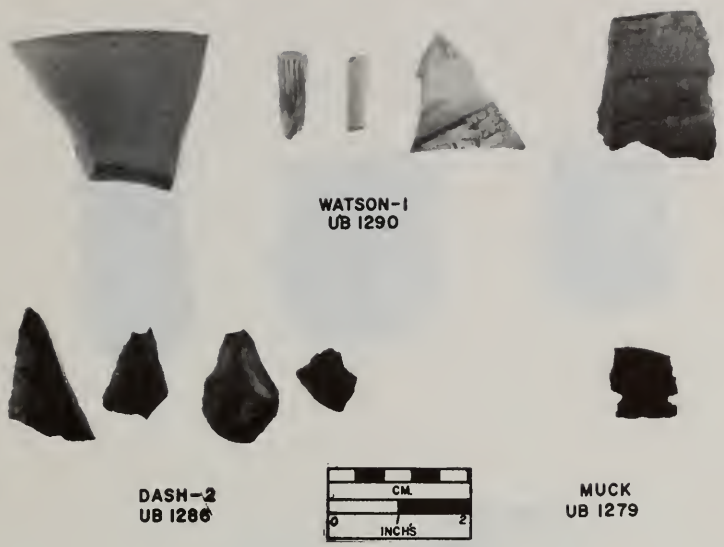


FIGURE 12: Watson I site, Historic Sherds and Kaolin Pipe Fragments.
Dash II site, Biface Fragments.
Muck site, Meadowood Point Base.
FIGURE 13: Markey I site; 1,2,5,6, Utilized Cores; 3, Bifacial Point Tip; 4, Unifacial Tool.

FIGURE 14: Markey II site; 1,3,Unifacial Tools; 4, Utilized Core.

FIGURE 15: Peglow Collection UB # 1288